No. 763,231. PATENTED JUNE 21, 1904.

J. C. WAUGH.

ACETYLENE GAS GENERATOR.

APPLICATION FILED APR. 27, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

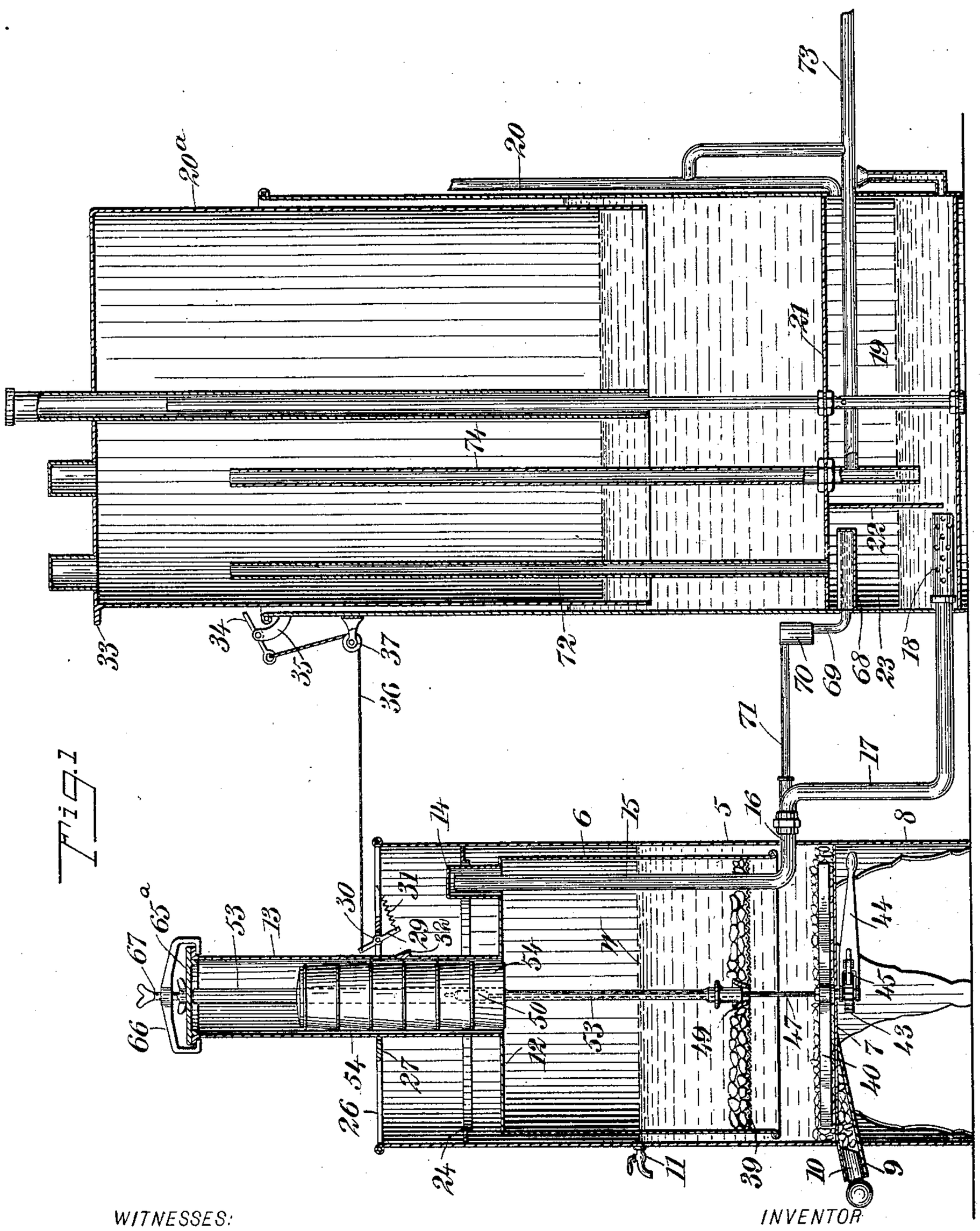

FIG. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3

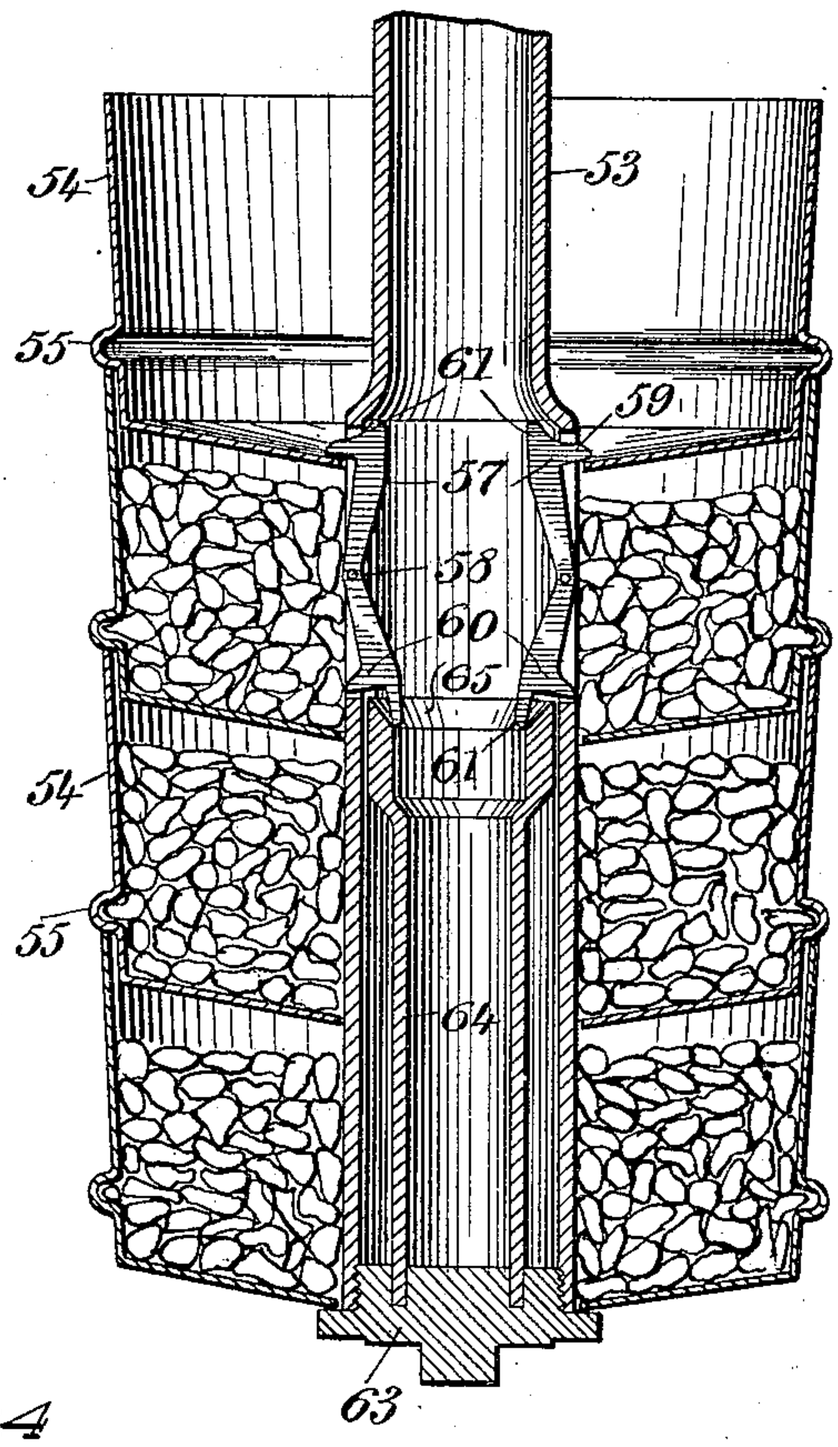


Fig. 2

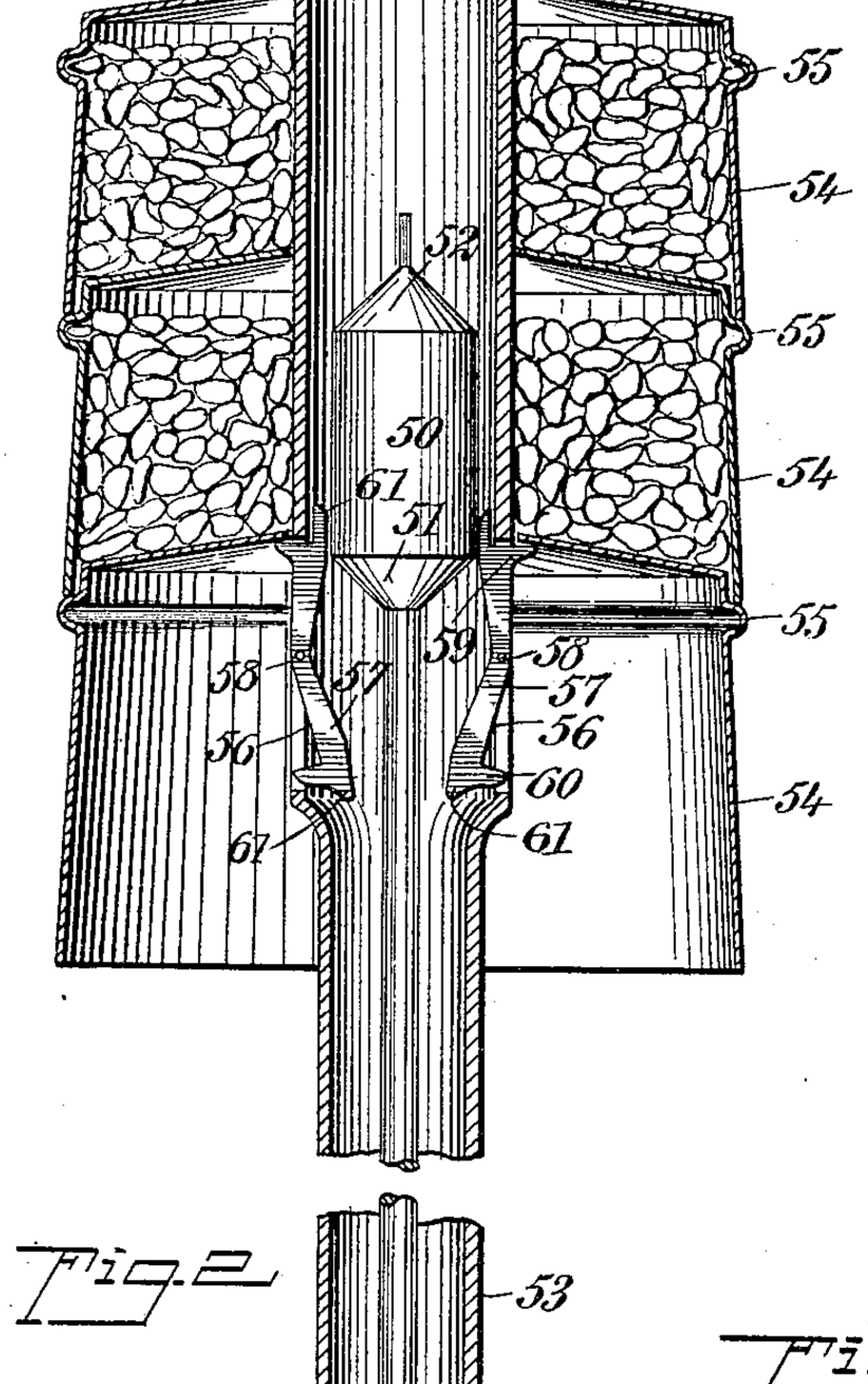


Fig. 4

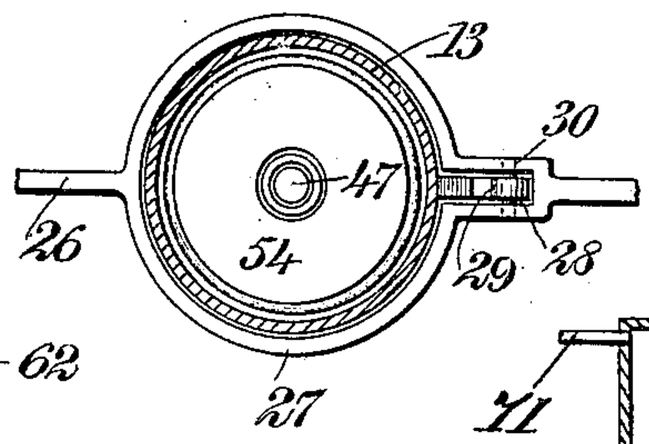


Fig. 5

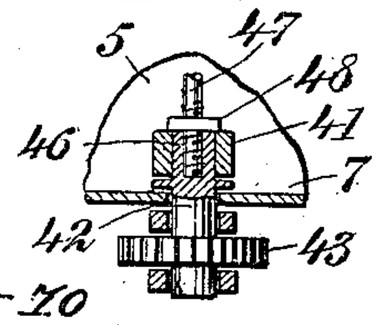


Fig. 7.

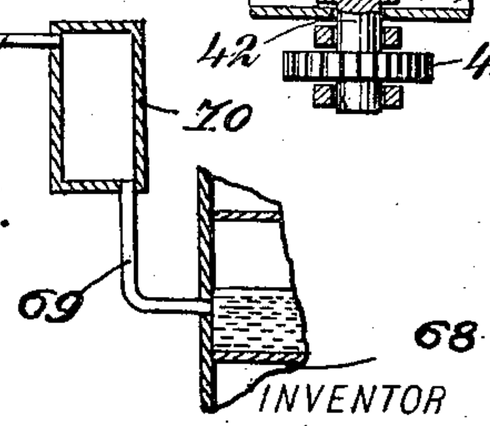
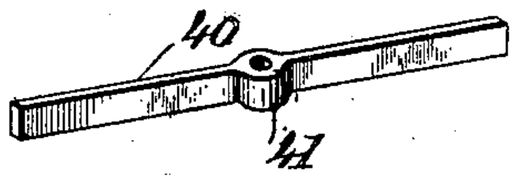


Fig. 6



WITNESSES:

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No. 763,231. Patented June 21, 1904.

UNITED STATES PATENT OFFICE.

JAMES C. WAUGH, OF MOLINE, ILLINOIS.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 763,231, dated June 21, 1904.

Application filed April 27, 1903. Serial No. 154,452. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. WAUGH, a citizen of the United States, and a resident of the city of Moline, in the county of Rock Island and State of Illinois, have invented a new and Improved Acetylene-Gas Machine, of which the following is a full, clear, and exact description.

This invention relates to improvements in acetylene-gas machines of that class wherein the carbid is dropped into a water-bath on the descent of a floatable gas-bell, due to consumption of gas which is stored in an expansible gas-holder.

One object of this invention is to provide an improved form of carbid-magazine wherein the carbid is confined in isolated layers by mechanical devices adapted to be released in an automatic and successive manner for the purpose of dropping the carbid layers on the successive downward movements of the floatable bell, such magazine being easily removed for the purpose of cleaning the parts and renewing the carbid-supply.

Another purpose of this invention is to provide means for equalizing the pressure between the generator and the expansible gas-holder just prior to renewing the gas-pressure in the generator by dropping a fresh charge of carbid therein, such pressure-equalizer being effective under normal conditions to cut off communication through itself between the gas-spaces of the generator and said gas-holder.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the novelty will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation through an acetylene-gas machine constructed in accordance with my invention and showing the generator-bell in its lowered position, so that the trip-dog 29 is free from a shoulder 32. Fig. 2 is an enlarged vertical sectional view through part of the carbid-magazine, showing the dogs in the positions they assume immediately after having released one of the carbid-layer trays. Fig. 3 is a detail sectional view, on an enlarged scale, showing the means employed by me for charging or filling the carbid-trays of the magazine. Fig. 4 is a detail sectional plan view showing the means for supporting a locking-dog which is adapted to hold the floatable bell and carbid-magazine of the generator in a raised position. Fig. 5 is a sectional detail view of the means for manipulating the agitator and holding the trip-rod in position, and Fig. 6 is a detail perspective view of the agitator adapted to stir the carbid residue within the generator preliminary to removing it from the machine. Fig. 7 is a sectional view through the pressure-equalizer.

5 designates the tank of the generator, and 6 is a floatable gas-bell which is fitted telescopically within said tank and is adapted to rise and fall freely therein, the lower open end of said bell being immersed in a water seal which partly fills the tank up to the line indicated at W in Fig. 1. The tank 5 is provided with a bottom 7, and said tank is sustained in a raised position in any suitable way—as, for example, by legs 8—thus raising the tank above the floor-line in a way to permit access to the under side of the bottom thereof for the purpose of operating the means for imparting rotary motion to the agitator within the generator. This tank is also provided with an inclined drain spout or nozzle 9, adapted to be closed in a suitable way—as, for example, by the removable plug 10—said spout or tube extending through the bottom 7 for the purpose of drawing off the water and residue contained in the generator. A valve or bib-cock 11 is attached to the generator-tank 5 at the point where it is desired to establish the water-line in the generator.

The floatable gas-bell 6 has a head 12, from which rises a central tube 13, that forms the carbid-magazine. The head of the gas-bell is also provided with an upstanding short tube 14, adapted to loosely receive the upper extremity of the gas-pipe 15, the lower part of which is bent to form an elbow 16, that passes through the wall of the tank 5, thus making provision for carrying off the gas produced in the generator by dropping carbid into the

water contained in the generator-tank 5. The elbow 16 of the gas-pipe 15 is coupled to an extension 17 of the gas-pipe, said extension having a perforated end 18, which is disposed in a bottom compartment 19 of an expansible gas-holder 20. This gas-holder is similar in substantial respects to structures ordinary in the art, and the tank of said gas-holder is provided with a partition or false bottom 21, the same forming the storage-compartment of the holder and the bottom chamber 19. From the false bottom 21 depends a vertical partition 22, which is immersed in a liquid seal contained in the compartment 19, and this partition forms a chamber 23 in said bottom compartment 19, said chamber being adapted to contain a part of a pressure-equalizing trap between the expansible gas-holder and the generator.

As shown by Fig. 1, the tank 5 rises a suitable distance above the head 12 of the floatable gas-bell 6 in the normal position of the latter, and within the upper part of this tank 5 is secured a stop-ring 24, said ring extending inwardly from the tank and disposed in the path of the gas-bell for the purpose of limiting the upward movement thereof under the pressure of gas produced within the generator. At the upper open end of the tank 5 is provided a cross bar or rod 26, the same being removably secured to the tank 5 in any suitable way. This cross bar or rod 26 is formed or provided with a central guide-ring 27, through which loosely passes the tubular carbid-magazine 13, as shown more clearly by Figs. 1 and 4, whereby the cross-bar and its ring serve as the means for guiding the magazine which is attached to and movable with the floatable gas-bell 6. The cross-bar 26 is also provided with a slot or recess 28, in which is loosely arranged a trip-dog 29, said dog being hung or pivoted at a point intermediate of its length, as at 30. To the lower end of the trip-dog is attached a coiled retracting-spring 31, having its other end fastened to the guide bar or rod 26, and the upper free end of this dog is adapted to fit below a shoulder 32, which is made fast with the carbid-magazine 13 and is disposed on the outside thereof in a position for engagement by the dog. This dog serves to hold the bell 6 and the magazine in their raised positions; but when the gas is consumed from the expansible gas-holder 20 the dog is automatically released from engagement with the shoulder of the magazine by suitable trip devices which are controllable by the floatable bell 20^a of said expansible gas-holder. This bell is provided with a lip 33, which on the descent of the gas-holder bell is adapted to engage with a trip-lever 34, fulcrumed to an offstanding arm 35 on the tank of the gas-holder. To one end of this trip-lever is connected a flexible cord 36, which is reeved around a guide-sheave 37, supported on the tank of said gas-holder, the other end of said cord 36 being attached to the trip-dog 29 in a way to pull the latter away from the shoulder 32 and against the tension of its spring 31.

The bell 6 of the generator is provided with a perforated diaphragm 39, which may be made of sheet metal or a metallic grid; but, as shown by Fig. 1, this diaphragm consists of a layer of foraminous material which is secured at its edges to the inside of the gas-bell 6 at a point just above the lower open end thereof. This diaphragm is supported on and movable with the gas-bell, and it is adapted to catch and retain the carbid which is dropped in charges from the elevated magazine 13, whereby the carbid is caught and retained by the perforated diaphragm, so that it will be immersed in the water contained in the generator. The carbid when deposited on the diaphragm is decomposed by the attacking liquid, and said carbid is retained on said diphragm until it is thoroughly dissolved, so as to form a pasty residue, in which condition the residue is free to ooze through the perforated diaphragm and accumulate on the bottom 7 of the generator-tank. The employment of this diaphragm insures the entire decomposition of the carbid before the residue is allowed to escape into the tank, and the gas resulting from the decomposition of water and carbid is free to rise through the water-bath in the generator, thereby cooling the gas and insuring the entire decomposition of the carbid. This overcomes the liability of subsequent generation of the gas, which is one of the objections to ordinary acetylene-gas machines. The diaphragm 39 also prevents the discharge of carbid if by neglect the residuum is allowed to accumulate until it comes up to the screen 39, as the generator-bell is prevented from falling, hence forcing the owner to draw off the residuum or be left in the dark. This function of the screen 39 prevents one possible cause of disaster.

To insure the removal of the spent carbid from the bottom of the tank 5, I employ an agitator of any suitable character. As shown by Fig. 6, this agitator is in the form of a bar 40, having an enlarged perforated hub 41; but it will be understood that the form of the agitator is not material. The agitator is mounted on the upper portion of a vertical shaft 42, which passes through an opening or stuffing-box provided in the bottom 7 of the tank 5, said hub 41 of the agitator being made fast in a suitable way to the upper portion of said short shaft 42. The lower part of the short shaft protrudes a suitable distance below the tank-bottom, and to it is secured a ratchet-wheel 43. (See Figs. 1 and 5.) A hand-lever 44 is forked or bifurcated and fitted loosely on the lower part of said shaft 42, so as to straddle the ratchet-wheel 43, and this hand-lever is equipped with an operat-

ing-pawl 45, which is adapted for engagement with said ratchet-wheel 43. It will be understood that the lever is loosely mounted on the shaft in order that it may be turned in one direction by hand for the purpose of making its pawl turn the ratchet, the shaft, and the agitator, thereby stirring the carbid residue contained in the tank. The upper end of the short shaft 42 is provided with a socket 46, which is internally threaded, so that a vertical stem or rod 47 may be screwed into the socket of said shaft, said rod being detachably connected to the shaft and held in a fixed position by means of a jam-nut 48. (See Fig. 5.) This stationary rod or stem passes loosely through a flared tube 49, which is fastened centrally to the perforated diaphragm 39 of the floatable bell 6. The rod or stem 47 passes upwardly through the tank 5 and the bell 6, so as to terminate within the tubular carbid-magazine 13, and the upper portion of this rod or stem is formed or equipped with a trip 50, the same being adapted to actuate the dogs which lock the carbid-trays and release the same on the vertical travel of the gas-bell and magazine. This trip 50 is shown by Fig. 2 in the form of a cylindrical body having a cone-shaped lower face 51 and a similar upper face 52.

The carbid-magazine is adapted to contain an elongated tube 53 and a series of inverted trays 54, the latter serving to mechanically isolate the charges of carbid, which may be either in the form of granulated, lump, or powdered carbid. The trays 54 are telescopically fitted at their open ends, each tray being provided with an annular bead or flange 55, which is arranged to be engaged by the edge portion of an adjacent tray in a way to limit the movement of the series of trays with relation one to the other. It will be understood that each tray 54 is provided with a bottom having an opening, and these trays are adapted to be threaded or fitted loosely on the tube 53, so that they may have overlapping engagement, as shown by Fig. 2. This tube 53 is adapted to be lowered through the carbid-magazine 13 and the floatable gas-bell 6 in a way for its lower extremity to be seated in the flaring tube 49, which is carried by the perforated diaphragm 39, the latter being in turn attached to the lower part of the bell 6, whereby the tube 53 and the series of carbid-trays fitted thereon are so connected with the floatable gas-bell as to travel vertically therewith.

The tube 53 is provided intermediate of its length with short longitudinal slots 56, in which are arranged the tray holding and locking dogs 57, each dog being pivoted intermediate of its length by a pin 58. The dog 57 is bent to have its upper and lower portions lie at an angle one to the other, and the end portions of each dog are provided with the outwardly-projecting toes 59 60 and with the inwardly-extending lips 61. (See Fig. 2.) The dogs are arranged in vertical positions within the slotted parts 56 of the tube, and they lie on opposite sides of said tube, each dog being arranged for one of its toes 59 or 60 to lie within the tube when the other toe is projected through one of the slots and outside of the tube. With the dogs in the position shown by Fig. 2 the toes 59 at the upper ends thereof engage with the bottom of one of the trays 54, so as to support the superposed trays and the charges confined therein. In this position of the dogs and trays the gas-bell 6 and the magazine 13 occupy their lowered positions and immediately after a charge of carbid has been dropped into the bell of the tank 5. The generation of gas following this discharge of carbid raises the bell 6, the magazine, and the tube 53. On the ascent of the parts the dogs 56 are carried upwardly with the carbid-trays and the tube 53, so that the lower heels 61 will ride against the cam-surface 51 of the trip 50, by which time the upper ends of the dogs will have cleared the cylindrical part of said trip. The engagement of the heels 61 at the lower ends of the dogs with said cam-surface 51 of the trip turns the dogs on their pivots, and the upper ends thereof are withdrawn into the tube and from engagement with the bottom of one tray 54. At the same time the lower ends of the dogs are forced outwardly for the toes 60 to lie in the path of one of the carbid-trays, whereby the lowermost empty tray is released from engagement with the toes 59 at the upper ends of the dogs, thus allowing the lowermost empty tray and the superposed filled trays to slide along the tube 53 until the bottom of said lowermost tray engages with the toes 60. With the tube, the trays, and the dogs in their raised positions the lowermost tray will be held from dropping by the toes 60, and the parts are now in position for the next operation.

When the trip-dog 29 is again released by the descent of the gas-bell 20^a of the expansible gas-holder, the bell 6, the magazine, and the tube 53 will drop by gravity. During this descent of the parts the upper ends of the dogs 56 will ride against the cam-surface 52, which turns the dogs on their pivots, so as to force the upper ends outwardly and withdraw the lower ends, so that the toes 60 will be disengaged from the lowermost empty tray, by which time the parts will have again assumed the position shown by Fig. 2, thus allowing the empty tray and the charge of carbid resting thereon to fall into the generator, whereupon a fresh increment of gas is produced, which again raises the bell 6 and its contained parts to place the trays of the magazine in position for subsequent operation.

It will be noted that the empty trays are free to slide along the tube 53, and the lowermost tray of the series is adapted to rest on

a shoulder or dogs 62, provided near the lower part of the tube 53, thus permitting the trays to be withdrawn with the tube 53 when it is desired to clean and dry the trays and renew the charges of carbid in the magazine.

In Fig. 3 of the drawings I have shown a means by which the carbid-trays may be readily recharged and the dogs 56 placed in condition for operation when the trays and the tube are replaced in the magazine and the bell of the generator. It will be understood that the tube 53, together with the trays, are readily withdrawable through an opening in the upper end of the magazine-tube 13, and after the parts shall have been removed they should be cleaned and dried. The tube 53 is now inverted or turned upside down, and this tube is equipped with a temporary head 63, having a setting-tube 64 attached thereto. The temporary head is threaded to enable it to be screwed into a threaded upper end of the tray-carrying tube 53, while the setting-tube 64 is attached to said temporary head for application therewith to said tube 53. The free end of the setting-tube is enlarged and inclined to produce thereon a flared mouth 65. When the head 63 is screwed to the tube 53, the setting-tube extends into the tube 53 for a suitable distance in order that its flared mouth may engage with the ends of the dogs 56, thus adjusting the latter to the position shown by Fig. 3. One of the carbid-trays is now slipped over the tube 53 and a charge of carbid is placed therein. This operation is repeated until the proper number of trays shall have been placed in position on the tube 53, the uppermost tray remaining empty or free from a carbid charge. The tube 53 and its contained parts are now reversed to assume the proper positions, and these parts are lowered through the magazine 13, so that the lower part of the tube 53 will seat itself in the flaring guide-tube 49 of the perforated diaphragm 39, which is attached to the gas-bell 6. The operator now unscrews the head 63 from the upper end of the tube 53, and this head with the setting-tube 64 are removed from said tube 53, thus allowing the said tube and its contained trays to remain in their proper positions within the magazine. When recharging, the head 63 should be only partly screwed down, so as to permit the trays to pass over the dogs freely. After the trays are all filled the head 63 should be screwed up tight, when it and the dogs will appear just as shown in Fig. 3.

The upper open end of the magazine 13 is closed by a head 65^a, adapted to be fastened tightly in place by means of a yoke 66 and a clamping-screw 67, said yoke and screw being readily removed when it is desired to obtain access to the interior of the magazine.

Another important feature of my invention resides in the provision of a gas-pressure equalizer between the expansible gas-holder and the generator, the same being shown by Fig. 1. In the chamber 23 at the bottom of the gas-holder tank is arranged an open-top shallow receptacle 68, which is adapted to contain a liquid seal about two inches in depth. With this receptacle 68 communicates the depending leg 69 of an externally-located trap 70, the cross-sectional area of this trap being in excess of the corresponding area of the leg 69. With the upper part of the trap 70 communicates a pipe 71, which is coupled in any suitable way to the elbow 16 of the intermediate gas-pipe 15 or the length 17 of said gas-pipe. The leg 69 of the trap communicates with the receptacle 68 about one-half of an inch below the level of the liquid seal therein, and the trap 70 is of such capacity as to contain more water than the leg 69 and the receptacle 68 combined. The presence of the liquid seal in the trap 70, the leg 69, and the receptacle 68 serves under normal conditions to cut off the communication between the gas-spaces of the expansible holder and the generator in the direction of backward flow—*i. e.*, from the gas-holder to the generator—but the seal offers slight resistance to the forward flow from the generator to the expansible gas-holder, the resistance being determined and regulated by the immersion of the pipe 69 in the seal of the receptacle 68. When the water is drawn off from the generator through the bib-cock 11, abnormal conditions are set up, and the suction created in the generator added to the normal pressure of gas in the gas-holder is sufficient to overcome the liquid seal, which is forced upward into the trap 70 until the lower end of the pipe 69 is exposed, whereupon the gas will pass upward and bubble through the liquid now contained in the trap 70, so as to pass on into the generator through the pipes 71, 16, and 15 until the pressure is equalized. The equalization of pressure in the gas-holder and the generator allows the liquid to return into the receptacle 68 and automatically reëstablish the seal. At a period just previous to renewing the generation of gas in the generator-bell 6 by dropping a fresh supply of carbid therein, the gas in the expansible gas-holder being exhausted and the pressure relieved, the gas remaining in the generator-bell 6 will flow through the equalizer to the gas-holder gradually, but by so doing the quantity in the generator-bell 6 is gradually decreased, and said generator-bell 6 sinks until a point is reached when a new charge of carbid is delivered.

It is understood that the pipes 71 69 are of small dimensions—usually three-eighths of an inch in diameter—while the pipes 17 19 are somewhat larger or about one and one-quarter inches in diameter and that no gas passes through the pipe 17 except when a new charge of carbid is dropped into the generator, at which time the gas passes through both the

equalizer and the pipe 17, or, in other words, all the gas over and above that which can pass through the equalizer passes through the pipe 17. It will furthermore be understood that the movement of the generator is controlled and regulated through the equalizer by the pressure in the gasometer, and, vice versa, the lack of pressure, as when the gas in the gas-holder is all consumed. The gas passes both ways under proper conditions from the generator to the gasometer easily through one-half inch of water, and vice versa, but very hard through a three-inch or more column of water.

The dog 29 is only a safety arrangement. In case the magazine should be opened when there was a charge left in the gas would escape and the charge be dropped and lost. If properly attended to, the machine will work perfectly without the dog 29. The specific gravity of the liquid seal in the receptacle 68 and the trap 70 is sufficient under normal conditions to seal the trap against the pressure of gas contained in the gas-holder.

In the normal service of the apparatus the pressure of gas in the generator and the gas-holder is sufficient to buoy up the bells 6 and 20^a. The flotation of the generator-bell is so proportioned that the pressure in the gasometer will be sufficient to keep said generator-bell at its uppermost position and against the stop-ring 24 so long as there is gas in the generator; but when the gas is consumed from the expansible holder the bell 20^a gradually settles until the tripping-lever 34 is reached, whereupon the dog 29 is withdrawn from the shoulder 32 and the bell 6, with the magazine, is permitted to descend by gravity. The trip 50 and the dogs 56 now operate to release one of the trays, and a fresh charge of carbid is dropped into the bell of the generator, whereupon a fresh increment of gas fills the generator sufficiently to raise the bell and magazine to a position where the dog 29 will again engage with the shoulder. The gas passes from the generator through the pipes 15 17 into the compartment 19 of the holder, from whence the gas rises into the bell 20^a through a pipe 72. The gas is supplied to the service-pipe 73 by an eduction-pipe 74.

In preparing the apparatus for service the tank 5 should be filled with water up to the level of the ring 24. The diaphragm 39 is placed in position within the bell 6, and the latter is inserted into the tank, after which the ring 24 and the guide-bar 26 are attached to the tank. The generator-bell with its attached magazine 13 are raised until the locking-dog 29 engages with the shoulder. The tube 53 having been supplied with the carbid-trays, the temporary head 63 and the setting-tube 64 are now placed in the generator in the manner heretofore described, and the head with the setting-tube are withdrawn. The bib-cock 11 is now opened, so as to draw off the water from the tank 5 until the level is lowered to said cock, after which the same is closed, and the generator is now ready for operation.

The improved gas-machine of my invention may be operated and controlled with safety in the hands of persons of ordinary intelligence, because there are no valves about the machine, and there can be no back flow of gas from the gasometer under ordinary conditions. If lime is allowed to accumulate sufficiently at the bottom of the generator to fill up the space between said bottom and the diaphragm 39, the necessary vertical travel of the generator-bell 6 is prevented and the machine will cease to operate until the surplus residue is removed by operating the agitator 40 and discharging the residue through the nozzle 9. It will be observed that there are no working parts which protrude through the machine above the water-level therein, thus dispensing with the use of stuffing-boxes and overcoming the possibility of leakage of the gas. It is evident that the generator may be recharged while the lights are burning and that there is no perceptible change in the pressure of the gas when a new charge is delivered into the water-bath present in the generator. The generator may be supplied with fresh charges of carbid in the magazine with a minimum loss of gas and a minimum admission of atmospheric air.

The generator is supplied with an abundance of water, which, in connection with the diaphragm 39, insures a cool state of gas and the complete decomposition of carbid, so that there will be no after-generation of gas. The parts are simple in construction, positive in action, and easily cleaned and recharged. It is only possible to drop one charge of carbid at a time, and this charge cannot be dropped until the gasometer-bell falls to a certain predetermined point. If desired, the unused charges of carbid may be removed and the empty trays may be refilled as desired. The machine may be equipped with means for indicating the number of unused charges of carbid in the magazine. The trap connected operatively with the gas holder and generator insures a complete equalization of gas-pressure in these parts.

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

1. The combination with a generator having a floatable bell, of a magazine movable with said bell, a stationary trip device within said magazine, a tube movable with said bell and magazine, a series of carbid-trays fitted to said tube, and trip devices movable with the tube and arranged for engagement with said stationary trip device and the series of trays.

2. The combination with a generator having a floatable bell, and a magazine thereon, of a

tube movable with said bell and extending into the magazine, a series of carbid-trays fitted on said tube, and trip devices for automatically releasing the trays successively on the descent of said bell and magazine.

3. The combination with a generator having a floatable bell, and a magazine thereon, of a tube fitted removably in said bell and magazine and adapted for vertical travel therewith, a series of carbid-trays fitted telescopically one to the other and slidable on said tube, tray-supporting means carried by said tube and adapted for engagement successively with each of said trays, and means for withdrawing said supporting means from said trays on the vertical travel of said bell and magazine.

4. The combination with a generator having a floatable bell, and a magazine thereon, of a tray-carrier movable with said bell and magazine, a series of trays fitted telescopically to each other and slidable on said tray-carrier, dogs mounted on the tray-carrier and arranged for engagement with one of said trays, and means for operating said dogs on the vertical travel of the bell and magazine, whereby one of said trays may be discharged and the superposed remaining trays may move a limited distance on the tube for engagement with said dogs.

5. The combination with a generator having a floatable bell, and a carbid-magazine, of a tube disposed therein, dogs pivoted to said tube, a series of carbid-trays fitted to said tube, and a stationary trip supported within the tube independently thereof and in the path of said dogs.

6. The combination with a generator having a floatable bell, and a carbid-magazine thereon, of a stationary rod having a trip, a carrying-tube loosely fitted over said rod and trip, a series of trays fitted loosely to said tube, and dogs mounted in said tube for engagement with said trays and with the trip on the rod.

7. In an acetylene-gas machine, a series of trays each having an external stop, said trays being telescopically fitted together in inverted positions, and one tray engaging with the stop of an adjacent tray, in combination with an expansible generator, a tube to which the trays are fitted, and means for automatically releasing the trays in successive order.

8. An acetylene-gas generator having a floatable bell, a diaphragm fixed in said bell and provided with a tubular seat, a magazine on said bell, a tray-carrying tube fitted removably to said tubular seat of the diaphragm, and trays carried by said tube.

9. An acetylene-gas generator having a floatable gas-bell, a carbid-magazine movable with said gas-bell, a stack of carbid-trays nested one within the other and housed in said magazine, and dogs actuated by the vertical travel of the gas-bell and coöperating with said trays for releasing the lowermost tray successively from the magazine, and for retaining the remaining trays of the stack within the magazine.

10. An acetylene-gas machine having a floatable gas-bell, a carbid-magazine movable vertically therewith, a tube fitted removably to said bell and the magazine, nested trays fitted to said tube and housed in the magazine, said trays being insertible and removable with the tube, and bell-controlled mechanism for successively discharging the trays.

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

JAMES C. WAUGH.

Witnesses:
W. J. ENTRIKIN,
F. C. ENTRIKIN.