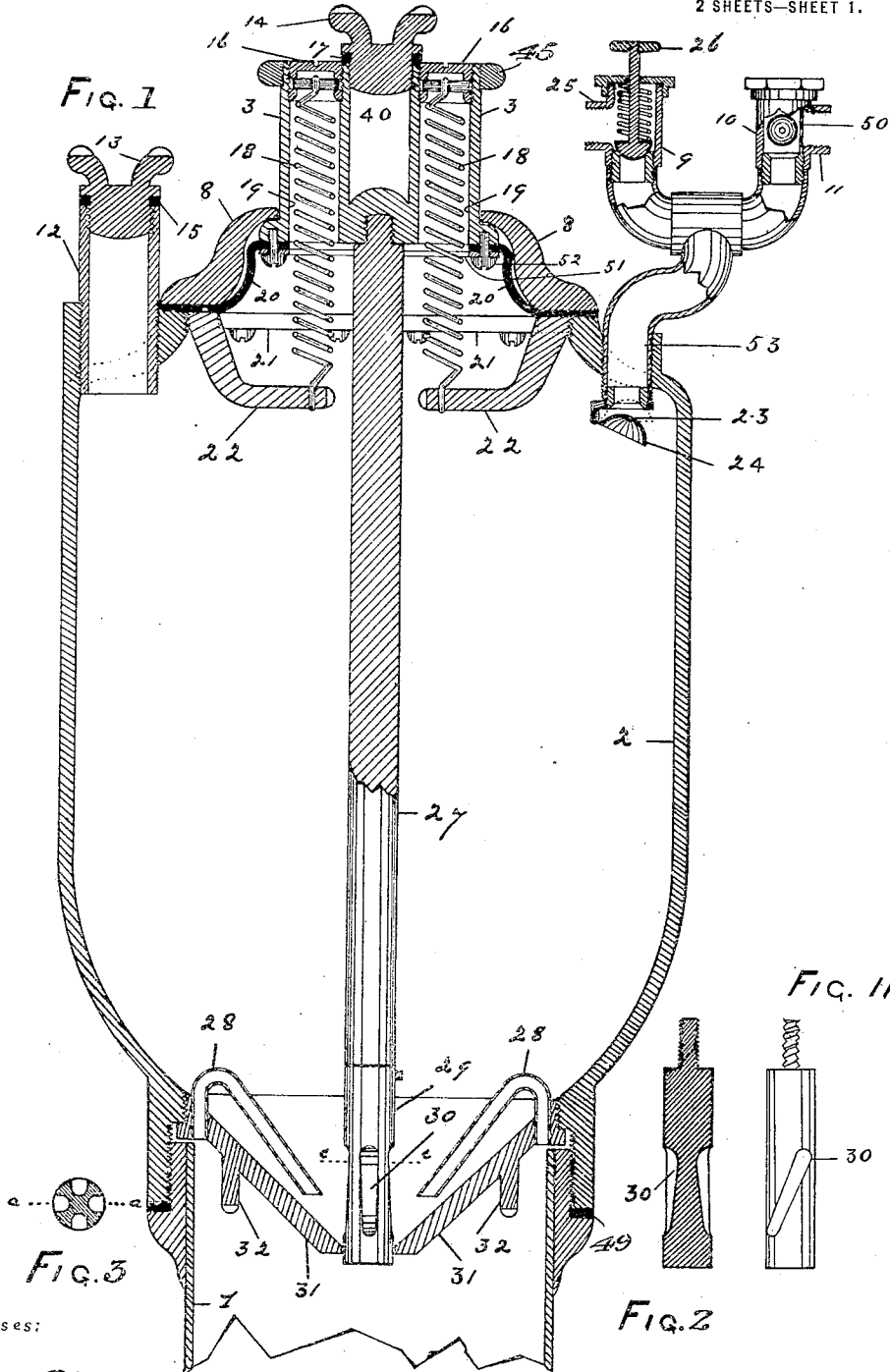


H. E. HENWOOD.
 AUTOMATIC ACETYLENE GENERATOR AND ATTACHMENT.
 APPLICATION FILED MAY 1, 1913.

1,246,094.

Patented Nov. 13, 1917.

2 SHEETS—SHEET 1.



Witnesses:

Wafel Dittgenholfer
Robert Richter

HORACE E. HENWOOD

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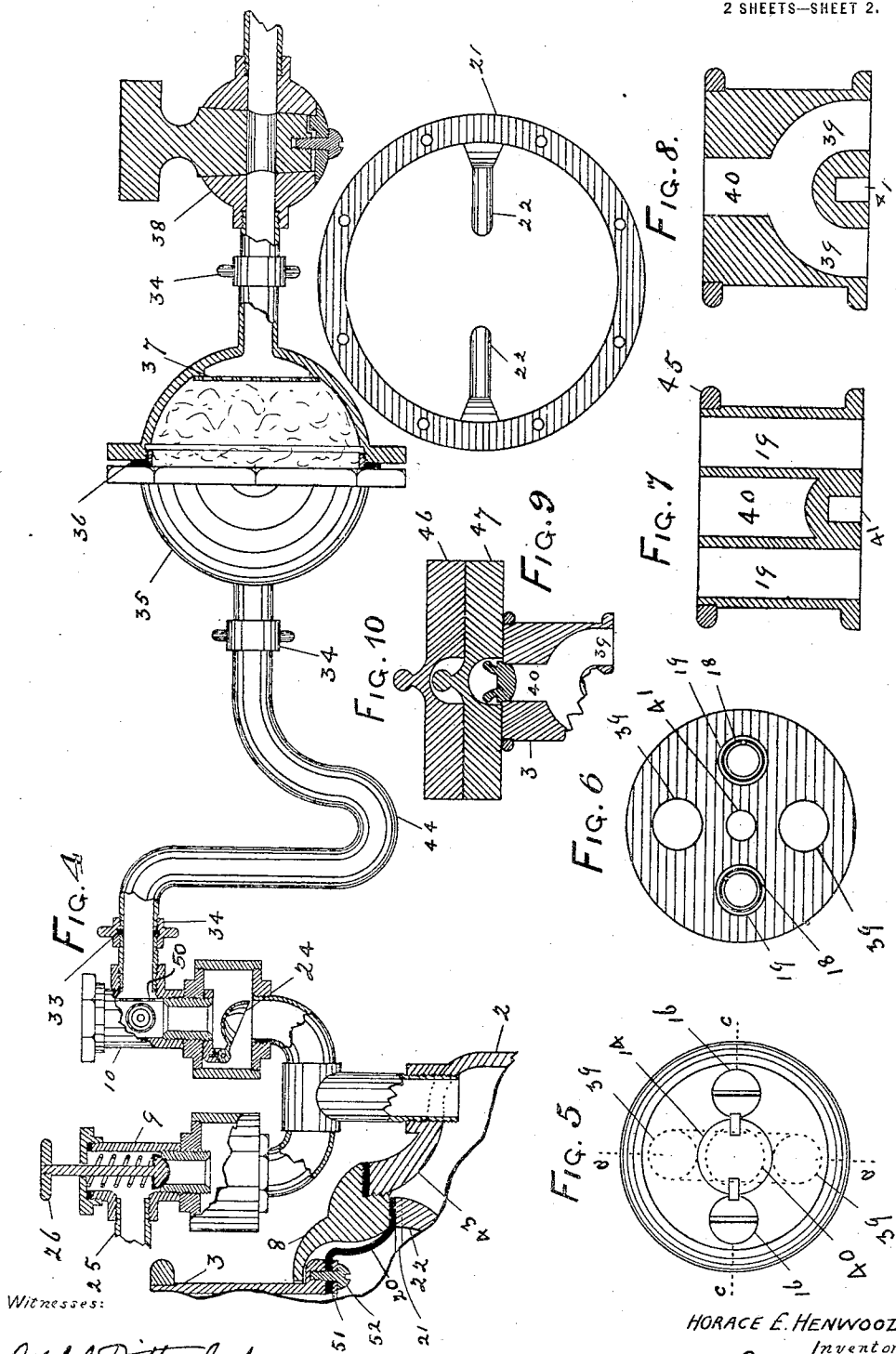
By *Warren Wright*
 Attorney

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UNITED STATES PATENT OFFICE.

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AUTOMATIC ACETYLENE-GENERATOR AND ATTACHMENT.

1,246,094.

Specification of Letters Patent.

Patented Nov. 13, 1917.

Application filed May 1, 1913. Serial No. 764,783.

To all whom it may concern:

Be it known that I, HORACE E. HENWOOD, a subject of the Kingdom of Great Britain, residing at New York city, in the county
5 and State of New York, have invented certain new and useful Improvements in Automatic Acetylene-Generators and Attachments, of which the following is a clear, full, and exact description.

10 This invention relates to acetylene generators of the type shown in application for United States Letters Patent numbered 674,648, 674,650 and 674,651, filed February 1st, 1912.

15 The object of the invention is to provide certain new and useful features of construction and relation, whereby the mechanical organization is improved, ease of access is obtained and greater neatness and compactness secured. These and other features of the invention will become apparent as the specification proceeds and the novel features and combinations will be pointed out more particularly in the claims.

25 The scope of my invention will be pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a central vertical section view of the carbid receptacle on line *c—c* Fig. 5.

30 Fig. 2 is a sectional view of feed plug 29, Fig. 2, on line *a—a* Fig. 3.

Fig. 3 is a sectional view of feed plug 29, line *c—c* Fig. 1.

35 Fig. 4 is a view of a fragmental section of Fig. 1, slightly modified, and showing pipe connection leading to the main; sectional views of the safety valve 9, non-return, ball valve 10, and pressure regulating valve 24; a flexible tubing 44; a dust arrester 35, partly in section; right-and-left threaded couplings 34; and an ordinary gas cock, in section.

Fig. 5 is a top plan view of reciprocating head 3, Fig. 1.

45 Fig. 6 is a bottom plan view of reciprocating head 3, Fig. 1.

Fig. 7 is a sectional view of reciprocating head 3, Fig. 1, on line *c—c* Fig. 5.

50 Fig. 8 is a sectional view of filling head 3, Fig. 1, on line *a—a* Fig. 5.

Fig. 9 is a top plan view of ring 21 and arms 22, Fig. 1.

Fig. 10 is a fragmental, sectional view of filling head 3, Fig. 1, on line *a—a* Fig. 5, and a sectional view of two weights, 46 and 47 superposing reciprocating head 3, Fig. 1.

Fig. 11 is an elevation view of a modified form of feed plug 29, Fig. 1.

As shown in Fig. 1, in the drawings: 1 is the water reservoir surmounted by a carbid receptacle 2, and both are screwed together by means of a threading formed on the bottom portion of the carbid receptacle and on the neck of the water reservoir; 3 is a filling head, which reciprocates in a central opening in lid 8 of the carbid receptacle; 8 is the lid of the carbid receptacle and is of a general dome-like shape; 9 is a safety valve; 10 is a non-return ball valve to prevent the gas from flowing back from the main to the carbid receptacle and also for the purpose of preventing air entering the main when charging the generator; 12 is a filling tube to charge the carbid receptacle with carbid; 13 is a closure stopper for filling tube 12; 14 is a closure cap for filling head 3.

In the reciprocating head 3 I have provided passages 19 to house springs 18, and I have also provided a beading around the bottom of said filling head 3 to prevent it from being completely projected through lid 8, when reciprocating. The springs 18, which are housed within the reciprocating head 3, are secured therein by closure plugs 16, and the closure plugs 16 also act as stoppers for passages 19. The filling head is secured to the carbid receptacle by an annular diaphragm 20, the inner periphery of which is fastened to the bottom of the filling head by a ring plate 51 and securing screws 52, while the outer periphery is fastened to the carbid receptacle by ring plate 21 by means of securing screws, the ring plate having a threaded engagement with the casing 2. I provide arms 22, which are a part of ring plate 21, to which the lower or inner ends of springs 18 are secured. Arms 22 and ring plate 21 are secured by screws to, and form a part of, lid 8, which is secured to the carbid receptacle by, preferably, a threading on the periphery of ring plate 21, though I may have the threading on lid 8, itself, as shown in Fig. 4 wherein 42 is a packing ring. Shaft 27 is secured to filling head 3,

and carries, at its lower end, feed plug 29, therefore, it is apparent that when lid 8 is unscrewed and removed from the carbid receptacle it carries with it filling head 3, springs 18, ring plate 21, diaphragm 20, shaft 27 and feed plug 29, as they are all united; thus by one operation an easy method is provided to gain access to the interior of the carbid receptacle. Outlet pipe 53 conveys the gas to the main, also to the escape valve. I provide a regulating valve 24 to prevent an excessive gas pressure in the main. When the feed plug 29 lets down too much carbid to the water reservoir, at one time, the gas generated is in excess of requirement and produces a high pressure in the main, which affects the lights. The regulating valve 24, by the excessive gas pressure, closes up and shuts off the pressure from the main though not completely, for I have provided a small aperture 23 in the regulating valve 24 to admit gas slowly to the main, until the gas pressure in the carbid receptacle has become normal, when the regulating valve falls open, again, to its normal position; 9 is the casing of the safety valve; 10 is the casing of the non-return ball valve. When gas ceases to flow into the main the ball immediately falls into its seat, thereby preventing gas returning from the main to the carbid receptacle; 11 is a pipe connection to the main; 50 is a perforated member fitting in the casing of the non-return ball valve to prevent the ball from choking the pipe leading to the main; 25 is a pipe connection leading from the safety valve to the outside of the building; 26 is a hand means to test the working condition of the safety valve, also, as a means for letting the gas escape to the open air outside the building, instead of into the room, when re-charging the generator; 14 is a closure stopper of passage 40, and branch passages 39 which can be better understood by reference to Fig. 8 and Fig. 10; 17 is a rubber packing ring.

When gas is being supplied for illuminating purposes, it is well known that the gas pressure does not require to be over three-quarters of a pound to the square inch, but when acetylene is being used for mechanical purposes, in combination with oxygen, to obtain an oxy-acetylene flame, the gas pressure in the generator should be over four pounds. To get this desired pressure, I provide weights, similar to 46 and 47, Fig. 11, placed upon the top of the reciprocating filling head 3. It is quite obvious, under such circumstances and also on account of the position the generator has sometimes to occupy, that charging the carbid receptacle through filling head 3 may be inconvenient, therefore, I have devised a carbid receptacle of such shape so as to provide for a filling means between the diaphragm and the wall

of the carbid receptacle, of which tubing 12 and closure cap 13, in Fig. 2 is an illustration; 15 is a packing ring.

Feed plug 29 Fig. 1, is a solid cylinder having independent, longitudinal cavities 30 formed therein; these cavities deepen and widen upwardly, their inner surfaces inclining downwardly and outwardly. The cylindrical portion of the feed plug below the grooves is solid and completely fills the aperture in the bottom of the carbid receptacle when the feed means is normally closed.

In Fig. 11 I provide a modified form of feed plug 29, Fig. 1, in which cavities 30 are formed obliquely or spirally.

I have provided a removable bottom 31 for the carbid receptacle which also forms the top of the water reservoir. The inner wall of the bottom slopes toward the center, as shown in Fig. 1; 32 are nodules on the bottom of the carbid receptacle to provide a hand grip to unscrew the same.

Tubes 28, Fig. 1 convey the gas to the carbid receptacle to a point close to the feed plug, so that the gas may be thoroughly dried by passing up through as much carbid as possible. The moisture in the gas when passing through the carbid decomposes a portion of it, forming additional gas, and leaving a residue of lime dust. This lime dust is carried by the gas current into the main and, in time, will choke it. To obviate this condition, I have provided a dust arrester 35, attached to the tubing leading to the main. The form of dust arrester I prefer is shown in Fig. 4, which consists of two semi-spherical globes 35, threaded together, and packed with cotton or other suitable material, to arrest and hold the dust; 36 is a rubber packing ring; 37 is a perforated partition, to prevent the packing material choking the outlet pipe.

In Fig. 4 I have provided a different location for the regulating valve 24, from that shown in Fig. 1, to prevent its interference with the working of the safety valve; 44 is a flexible tubing connecting the carbid receptacle to the main; 34 are right-and-left threaded couplings for making the connections.

In Fig. 7, 45 is a section of a ring that surrounds and is fastened to the top of filling head 3 to prevent the filling head from completely passing through the central opening in lid 8.

In operation, after water has been placed in the water reservoir and carbid placed in the carbid receptacle and all the closure plugs have been fastened down, the springs in the filling head will contract, which will lower the filling head and the diaphragm, and thereby move the cylindrical, closure part of the feed plug below the orifice in the bottom of the carbid receptacle, thus

allowing the carbid to pass down and out through the groove in the feed plug into the water reservoir causing a generation of gas, and the gas will pass through the tubes in the bottom of the carbid receptacle and up through the carbid, creating a pressure, until such pressure is sufficient to expand the diaphragm and raise the filling head, which cuts off a further feed of carbid. Upon the sumption of the gas, the pressure will be depleted, and the feed plug is again dropped, thus automatically keeping up a supply of gas, as it is consumed.

In carrying out this invention, details of construction may be varied from those shown, and yet the essence of the invention be retained; some parts might be employed without others, and new features thereof might be combined with elements old in the art, in diverse ways, although the herein described type is regarded as embodying substantial improvements over such modifications.

As many changes could be made in the above construction, and many apparently widely different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description, or shown in the accompanying drawings shall be interpreted in an illustrative and not in a limiting sense.

It is furthermore desired to be understood that the language used in the following claims is intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Features disclosed but not claimed herein constitute the subject-matter of claims of my copending application Serial Number 674,648, filed February 1, 1912, renewed March 7, 1914, Serial Number 823,245.

I claim as my invention:

1. In an acetylene gas generator, a water chamber, a carbid receptacle having a feed aperture in its bottom, a filling head, a flexible diaphragm between the filling head and the carbid receptacle, springs within the filling head secured at their inner ends within the carbid receptacle, and a shaft secured to the filling head and having means at its lower end controlling said feed aperture.

2. In an acetylene generator, a water reservoir, a carbid receptacle having a feed aperture in its bottom, a diaphragm, a vertically movable head mounted in the center of the diaphragm, a shaft attached to said head and having means at its lower end controlling said feed aperture, said head having cavities at opposite sides of the said shaft, extension springs partly housed with-

in said cavities and secured at their upper ends to the head, and anchorages below said head for the lower ends of the springs.

3. In an acetylene generator, a water reservoir, a carbid receptacle, a bottom forming the top of the water reservoir and provided with a feed aperture, a feed means operating in said aperture, a shaft connected to said feed means, a reciprocating head connected to the shaft, a flexible diaphragm connecting the reciprocating head to the carbid receptacle, springs controlling the reciprocating head, and passages in the reciprocating head to house said springs, said passages having closure stoppers.

4. In an acetylene generator, a casing containing a water reservoir and a carbid receptacle having a feed aperture in its bottom, a diaphragm, a head mounted in the center of the diaphragm, a shaft attached to said head and having means at its lower end controlling the feed aperture, extension springs at opposite sides of the shaft connected at their upper ends to the head, and means projecting inwardly within the upper part of the casing and affording anchorages for the lower ends of said springs.

5. In an acetylene generator, a water reservoir, a carbid receptacle having a central aperture in its bottom, a removable lid for the carbid receptacle, a reciprocating head operating in said lid, a means for controlling said head, a flexible diaphragm securing said reciprocating head to the carbid receptacle, a shaft connected to said reciprocating head, a feed means connected to the lower end of said shaft and operating through the central aperture in the bottom of the carbid receptacle, and a means for filling said carbid receptacle with carbid through the lid of said receptacle, said filling means being situated between the flexible diaphragm and the side wall of the carbid receptacle.

6. In an acetylene generator; a water reservoir; a means for filling said reservoir; a carbid receptacle having a central aperture in its bottom; a feed means operating in said aperture; a shaft connected to said feed means; a reciprocating head operating through the top of said carbid receptacle and secured to said shaft; a flexible diaphragm connecting said head to said receptacle; and springs secured in passages of said reciprocating head for controlling said head.

7. In an acetylene generator, a water reservoir and thereover a carbid receptacle, in combination with a diaphragm, a device controlling feed of carbid from the receptacle to the water reservoir, a head carried by said diaphragm and in turn connected with the feed device, said head having a passageway therethrough for the introduc-

tion of carbid into the carbid receptacle and means for closing said passageway, and being further provided with other laterally spaced passages also furnished with closures, and springs in the latter passages for controlling the movements of the diaphragm and head.

Signed at New York city, New York,
this 30th day of April, one thousand nine
hundred thirteen.

HORACE E. HENWOOD.

Witnesses:

F. WARREN WRIGHT,
FRED F. WEISS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."