No. 685,259. Patented Oct. 29, 1901.

G. H. COOK.

ACETYLENE GAS GENERATOR.

(Application filed July 12, 1900.)

(No Model.) 2 Sheets—Sheet 1.

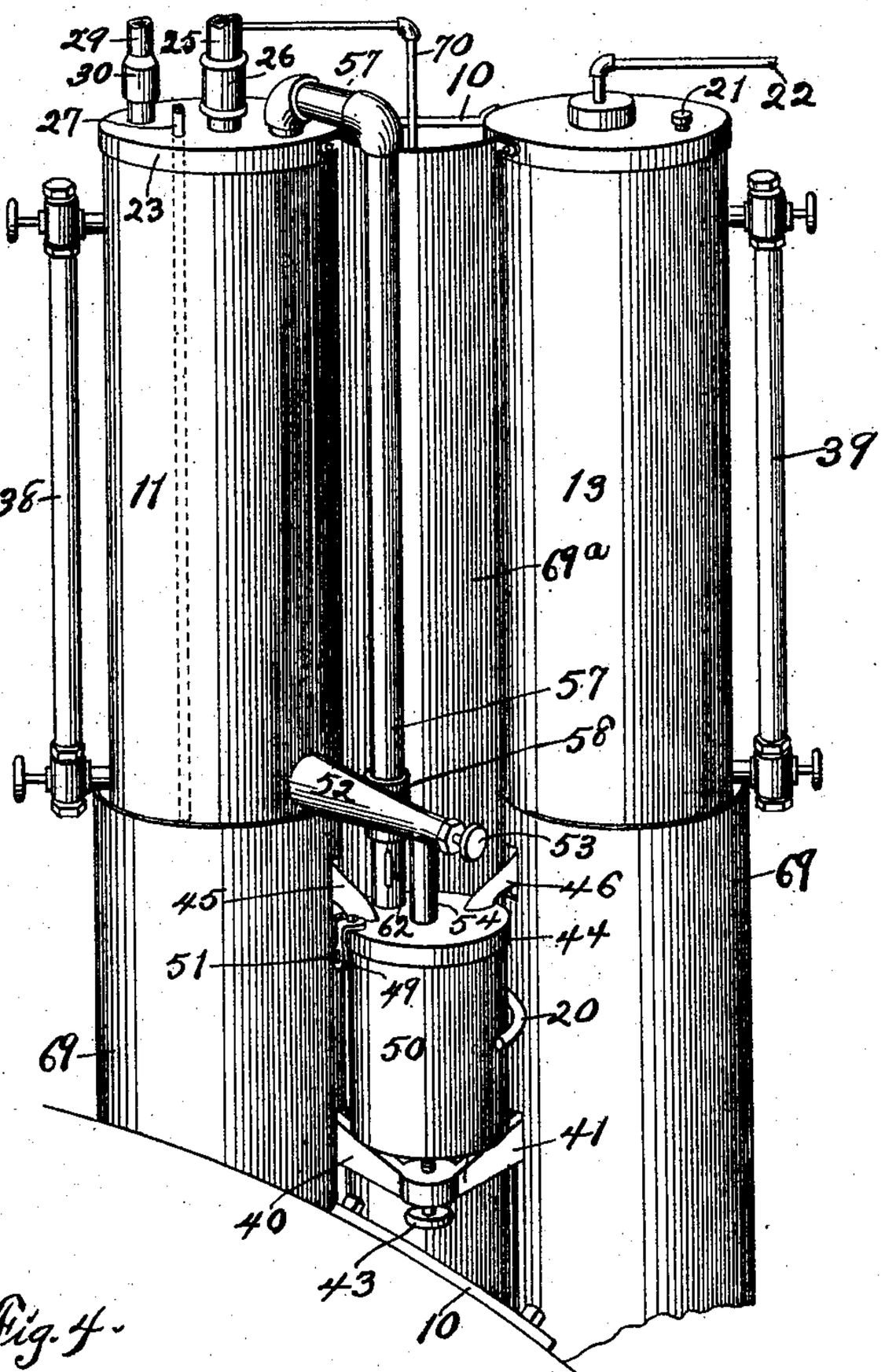

Fig. 1.

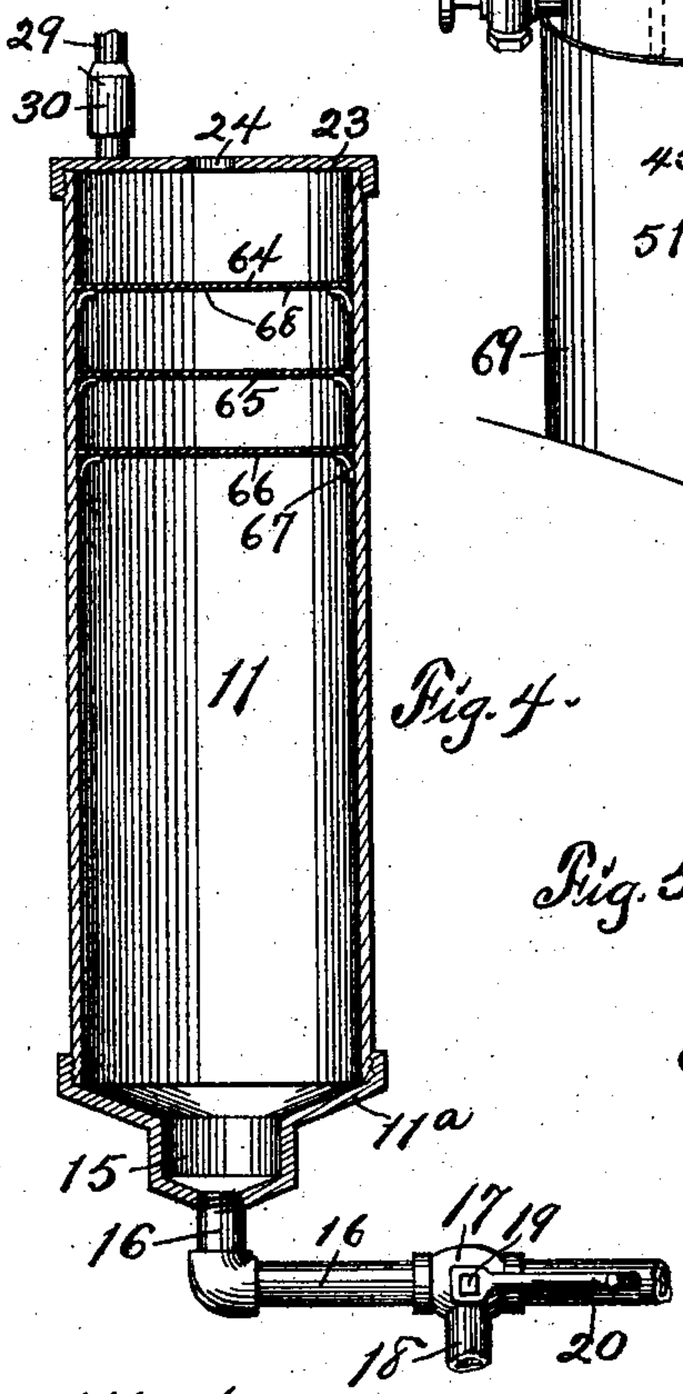

Fig. 4.

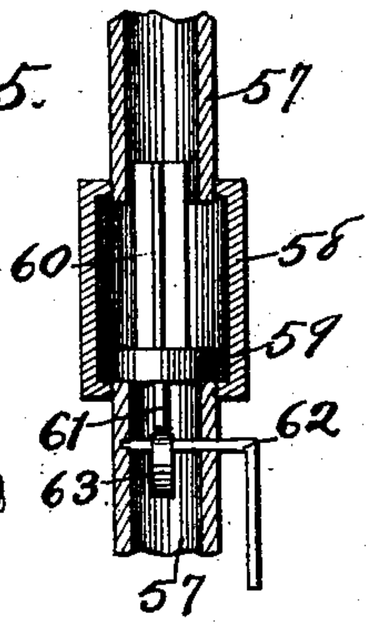

Fig. 5.

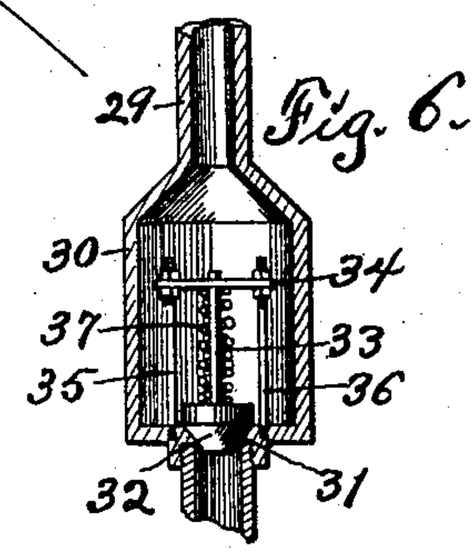

Fig. 6.

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ACETYLENE GAS GENERATOR.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

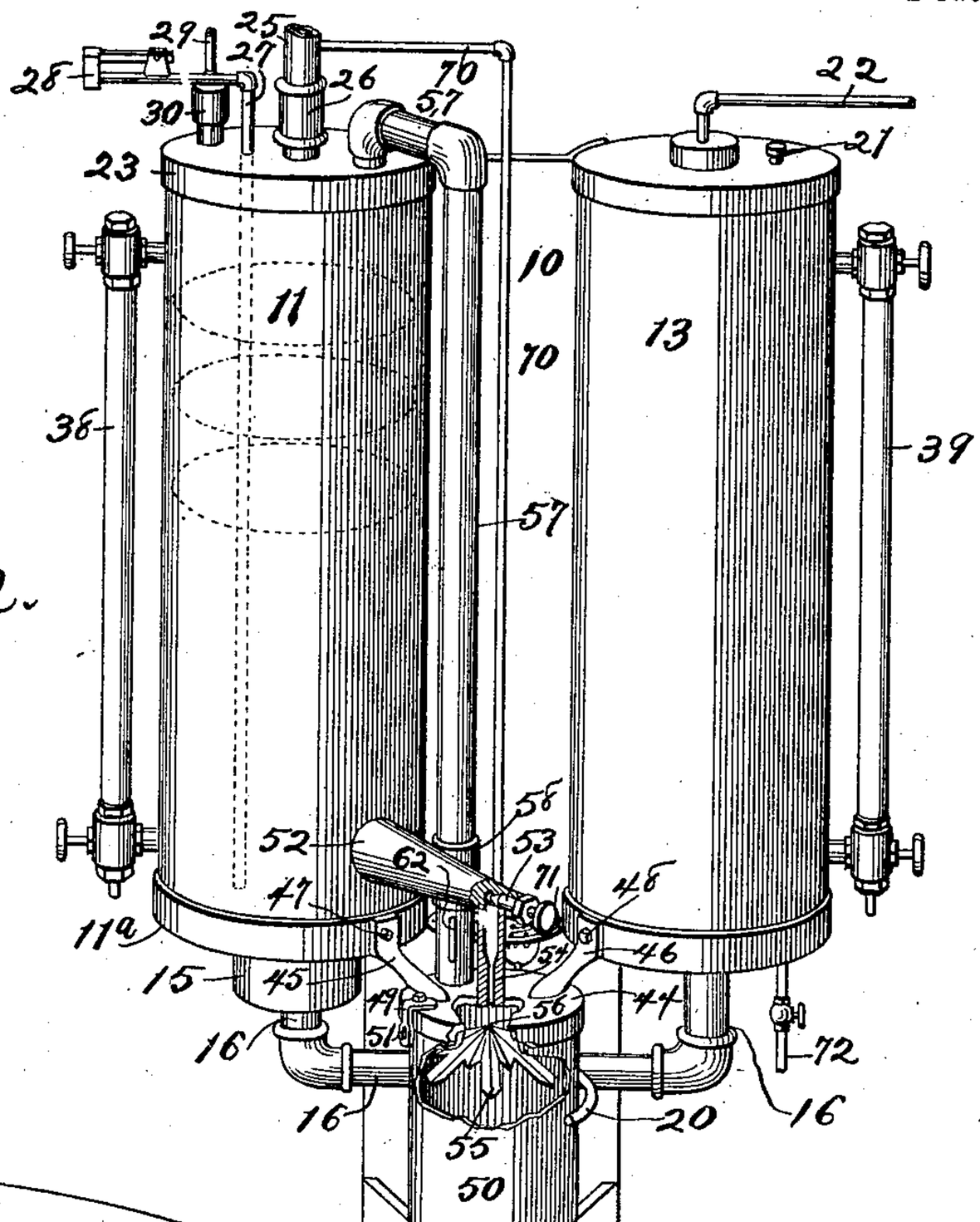
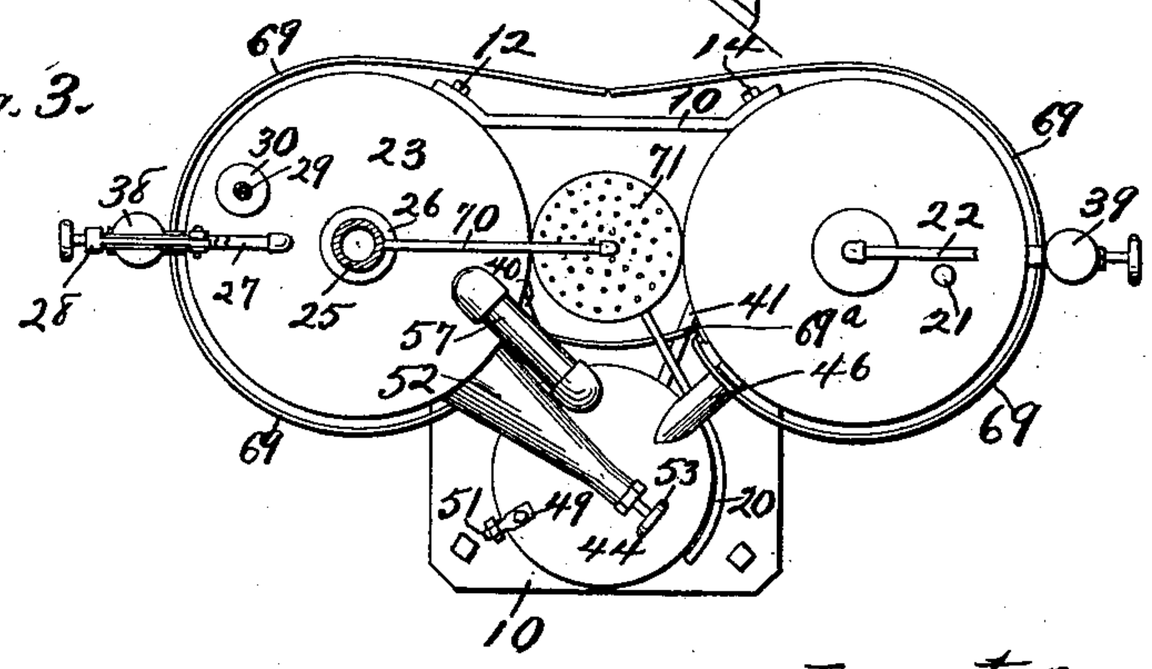


Fig. 3.



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UNITED STATES PATENT OFFICE.

GILES H. COOK, OF DES MOINES, IOWA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 685,259, dated October 29, 1901.

Application filed July 12, 1900. Serial No. 23,416. (No model.)

To all whom it may concern:

Be it known that I, GILES H. COOK, a citizen of the United States of America, and a resident of Des Moines, Polk county, Iowa, (having post-office address at 1212 Woodland avenue, same place,) have invented certain new and useful Improvements in Acetylene-Gas Generators for Locomotive-Headlighting, Automobiles, and Naval Search-Lights, of which the following is a specification.

The object of this invention is to provide improved means for generating gas from carbid for use in locomotive-headlighting, for automobiles, naval search-lights, and other purposes of illumination.

My invention consists in the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a perspective showing the device mounted as required for practical use. Fig. 2 is a perspective of the device mounted as required for practical use, the shield or guard being removed and a portion of the device broken away or in section to reveal the construction thereof. Fig. 3 is a plan of the device. Fig. 4 is a detail vertical section of one of the cylinders. Fig. 5 is a detail vertical section of a gas-pipe, showing the check-valve therein and means for holding said valve open. Fig. 6 is a detail vertical section of a pop-valve employed in the device.

In the construction of the device as shown the numeral 10 designates a supporting-frame formed with a foot or base arranged for attachment to a locomotive-boiler or other suitable means of support. A cylinder 11 is mounted in a vertical position parallel with one edge of the frame 10 and is secured thereto by studs 12, one only of which is shown, traversing the adjacent edge of the frame and seated in the side of the cylinder. A cylinder 13 of approximately the same size as the cylinder 11 is mounted parallel with the edge of the frame 10 opposite to the first cylinder and is secured in vertical position parallel with and spaced apart from the first cylinder by means of studs 14, one only of which is shown, traversing the edge portion of the frame and seated in the side of said cylinder 13. Justified by the inherent constructions of the cylinders, that hereinafter will become apparent in the further consideration of the structure, the cylinder 11 will be denominated the "air-tight" cylinder and the cylinder 13 will be referred to as "open" or "open to atmospheric pressure." The air-tight cylinder 11 is formed with an imperforate side and a concavo-convex bottom 11^a, rigidly mounted on the lower end thereof, with its convex face downwardly. The central portion of the bottom 11^a is depressed or offset downwardly a material and considerable distance and forms a trap-chamber 15 in a horizontal plane entirely below the bottom of the cylinder. An aperture is formed in the center of the bottom of the depressed portion or trap-chamber 15, and a water-pipe 16 is mounted therein and communicates with the cylinder therethrough. The pipe 16 extends downwardly from the trap-chamber 15, is bent and extends horizontally across the face of the frame 10, and is bent again and extends upwardly into the lower portion of the cylinder 13 and communicates with the interior of said cylinder. The pipe 16 serves as a means of communication between the trap-chamber 15 of the cylinder 11 and the cylinder 13 and may be constructed in any desired manner, so long as it retains the essential characteristics of a communicating pipe having its initial end below the bottom of the air-tight cylinder and its terminal within or communicating with the interior of the open cylinder. In Fig. 4 I have illustrated a valve-chamber 17 in the central portion of the pipe 16 and formed with a drainage-port 18 leading downwardly therefrom. A three-way valve 19 is mounted in the valve-chamber 17 and is so shaped and arranged in a common manner as to control the flow of fluids through said valve-chamber and govern the communication through the pipe 16 and to the drainage-port 18. A crank or handle 20 is mounted on the outwardly-projecting portion of the valve-plug 19, and the parts are relatively so arranged that when the said handle is in a horizontal position, extending to the right and outwardly from the valve-plug, communication through the valve-chamber in the trend of the pipe 16 is established and the port 18 is cut off. A supply or feeding port is formed in the top of the open cylinder 13 and closed by a cap 21.

The cylinder 13 may be supplied with water through the feeding or supply port to the desired degree, and said water will flow through the pipe 16, valve-chamber 17, and trap-chamber 15 into the cylinder 11 and fill said cylinder 11 to the desired level. It is the function of the pipe 16 to establish and maintain a communication whereby the water may flow freely back and forth from cylinder to cylinder during the operation of the machine in generating gas, furnishing water to the carbid-holder when needed, and permitting recession of the water from the cylinder 11 under pressure of gas therein. A pipe 22 communicates with and leads from the top of the cylinder 13 and is open to the atmosphere at some point distant from the cylinder. It is the function of the pipe 22 to provide a vent for the cylinder 13 and supply said cylinder with atmospheric pressure. The cylinder 13 might be left open within the locomotive-cab or any other inclosure where the machine is employed; but under some circumstances the water therein would become tainted with the odors of the carbid and acetylene gas and give off unpleasant and perhaps injurious effluvia. Hence I have provided the pipe 22, that may be extended outside the inclosure or locomotive-cab to a point where the discharge of tainted odors therefrom would have no perceptible influence or effect.

A cap-plate or cover 23 is mounted rigidly on and closes the top of the cylinder 11 and is formed with an aperture 24 in its central portion for the reception of a service-pipe 25. A safety-pipe 27 is mounted in and extends through the top 23 of the cylinder 11, and the initial end of said safety-pipe is open and located adjacent to the upper surface of the bottom 11^a of said cylinder, Fig. 2. Above the cover or cap-plate 23 of the cylinder 11 the safety-pipe 27 may extend any desired distance to the exterior of the locomotive-cab or other inclosure within which the machine is used, and a safety-valve 28 is mounted on and normally closes the terminal of said pipe. The safety-valve should be so adjusted or weighted as to apply the desired resistance to the escape of gas or water from the terminal of the safety-pipe. It is the function of the safety-pipe to provide for the discharge of a surplus of water from the cylinder 11 in the event that communication between the cylinders 11 and 13 should accidentally or through some unforeseen circumstance or condition be interfered with or stopped to the end that generation of gas may not continue beyond that degree necessary to supply the desired quantity for consumption at the burners. A gas safety-pipe 29 is mounted in and communicates through the cap-plate or top 23 of the cylinder 11 and may lead to and communicate with the atmosphere at any desired place outside the locomotive-cab or other inclosure within which the machine is used. The gas safety-pipe 29 is provided with a valve-chamber 30, and a pop-valve is mounted therein.

The pop-valve in the chamber 30 is shown in detail in Fig. 6. A valve-seat 31 is formed in the lower portion of the chamber, and a valve-plug 32 rests thereon and is centered by a valve-stem 33, rising from the plug and extending loosely through a cross-bar 34. The cross-bar 34 is mounted adjustably on studs 35 36 within the chamber, and an expansive coil-spring 37 is mounted on the valve-stem and is confined between the cross-bar and the upper face of the valve-plug. It is the function of the coil-spring 37 to hold the valve-plug 32 to the seat 31 by yielding pressure that may be overcome by the pressure of gas within the cylinder 11 at a predetermined degree.

Gage-glasses 38 39 are mounted on and communicate with the cylinders 11 13, respectively, by means of which glasses the level of the water in either cylinder may readily be determined.

Arms 40 41 are formed on and extend laterally in converging planes from the lower portion of the frame 10, and a hub or boss 42 is formed on and connects the extremities of said arms. A vertical screw-seat is formed in the central portion of the hub 42, and a hand-screw 43 is mounted therein. A generator-cover 44 is located in a horizontal plane slightly below the bottoms of the cylinders 11 13 and is attached to said cylinders by arms 45 46, formed on said cover and secured to the cylinders by studs 47 48. A hanger 49 is pivoted on and depends from the generator-cover 44, and a generator or carbid-holder 50 is formed with a lug 51, projecting radially from its upper end portion and so shaped and arranged as to enter a slot in the lower portion of said hanger. The screw 43 engages the center of the bottom of the generator or carbid-holder 50 and lifts said holder into sealed contact with the bottom of the generator-cover 44. A gasket should be interposed between the upper edge of the generator or carbid-holder and the lower face of the cover 44 to the end that when said holder is set tightly and forcibly against the cover by means of the screw 43 the joint therebetween will be rendered air and gas tight. It is the function of the screw 43 to hold the carbid-holder in close relation to the cover 44. A pipe 52, having a frustum-shaped bore, is mounted with its larger end extending through the side of the cylinder 11, near the upper surface of the bottom thereof, and communicating with the interior of said cylinder. The bore of the pipe 52 is frustum-shaped in order that water splashed therein may readily run back into the cylinder 11. A needle-valve 53 is mounted in and extends outwardly from the outer portion of said pipe 52 and governs and controls the extremity of the bore of said pipe. A feed-pipe 54 communicates with the outer end portion of the bore of the pipe 52 and leads therefrom downwardly through the center of the generator-cover 44. The communication between the bore of the pipe

52 and the bore of the pipe 54 is controlled by the needle-valve 53. The bore of the pipe 54 is tapering and smaller at its lower end, thus providing for the discharge of a relatively small stream or quantity of water from the cylinder 11 into the generator or carbid-holder 50. A deflector 55 is mounted in the upper portion of the carbid-holder 50 and may be suspended by rods (not shown) depending from the cover 44. The deflector 55 is concavo-convex in general contour and is positioned with its convex face upwardly and its apex immediately below and in alinement with the lower end or terminal of the bore of the pipe 54. The deflector 55 is formed with an aperture 56 in its center in alinement with the bore of the pipe 54 and also is formed with corrugations, flutings, or alternate ridges or grooves leading radially and downwardly from said central aperture to the perimeter of the deflector. Some of the corrugations are of less length than others and are arranged alternately therewith, thus providing that the deflector presents a serrated or deeply-notched perimeter or margin. It is the function of the deflector 55 to receive the water drop by drop or in a small stream from the pipe 54 and distribute said water over the carbid contained in the lower portion of the vessel or holder 50. When water is entering the carbid-holder in minute drops and the locomotive on which the device is mounted is stationary, said water or the major portion thereof will drop through the aperture 56 directly in the center of the carbid. When water is entering in greater quantity or the locomotive is in motion, said water will be distributed by the corrugations to different parts of the body of carbid, to the end that said carbid will be sprinkled and dampened in its entirety, thus providing for the utilization of all the gas-generating properties of the carbid substance. The flow of water may be regulated as required for the production of gas by adjustment of the needle-valve 53.

A gas-pipe 57 is mounted in and extends through the cover 44 at its lower end, and the upper end of said pipe extends through and opens below the cap-plate or cover 23 of the cylinder 11. It is the function of the pipe 57 to lead the gas generated in the carbid-holder 50 into the cylinder 11, from which cylinder it may be drawn as desired for the burners. A valve-chamber 58 is formed in the lower portion of the gas-pipe 57, and a check-valve is mounted therein. Portions of the pipe 57 and the chamber 58 are shown in detail in Fig. 5, wherein the check-valve 59 is shown seated in the chamber and formed with an angular stem 60, extending vertically therefrom and into the pipe 57 to serve as a guide and prevent upsetting of the valve. A short stem 61 is formed on and extends downwardly from the check-valve 59 within the lower portion of the gas-pipe 57. A crank-shaft 62 is mounted for rotary movement in and across the lower portion of the gas-pipe 57, and an eccentric 63 is fixed to said crank-shaft within the pipe below and in vertical alinement with the short stem. The check-valve is employed to relieve the carbid-holder of back pressure from the cylinder 11 and prevent the escape of gas from the upper portion of the pipe 57 and cylinder when the carbid-holder is removed for any purpose. In the ordinary use of the check-valve the gas escaping from the carbid-holder would encounter a resistance equal to the weight of the valve and any friction thereof against the pipe or valve-chamber, and to obviate the disadvantage of such resistance I have provided the crank-shaft and eccentric so arranged as to be manipulated to cause the eccentric to engage the short stem 61 and lift the valve from its seat, thus providing a free course or passage-way for the gas through the valve-chamber and pipe. The eccentric should be positioned to lift the valve by turning the crank of the crank-shaft upward into engagement with the periphery of the valve-chamber, the crank springing slightly when forced into position and impinging the surface of the valve-chamber sufficiently to hold it in the desired place. When the carbid-holder is removed for any purpose or is not in operation, the crank-shaft should be positioned, as shown in Figs 1. 2, and 5, to relieve the carbid-holder of back pressure from the pipe 57 and cylinder 11.

The three-way valve 19 may be omitted and the pipe 15 fitted with a check-valve, such as that illustrated in Fig. 5, preferably located in the vertical portion of the pipe immediately below the bottom of the open cylinder 13.

In the use of a machine of this character for locomotive-headlighting the water in the cylinder is subjected to violent and turbulent motion by reason of the swaying, jolting, and vibrating of the locomotive in rounding curves, traveling upon uneven tracks, and traveling at a high rate of speed. On account of the turbulent motion of the water and the vibration of the machine and locomotive on which it is carried more or less of any water contained in the air-tight cylinder 11 will be thrown, splashed, or otherwise conveyed into the pipe 52 and will find its way from said pipe to the carbid and lend its influence to the generation of gas, even at times and under circumstances when it is not desired that gas be generated in the carbid-holder or supplied to the air-tight cylinder. It is to avoid the surplus generation of gas that I have provided the trap-chamber 15, into which the water may recede from the cylinder and yet be contained in sufficient quantity to seal against the passage of gas from the cylinder 11 to the open cylinder 13 and thence to the atmosphere. I have shown the pipe 16 leading downwardly and laterally from the trap-chamber 15; but it is probable that the same function might be performed through the use of the trap-chamber with an imperforate bottom and a communicating pipe having its initial end open within the trap-chamber, its termi-

nal discharging into the cylinder 13, and its body portion leading upwardly from the trap-chamber and laterally from the cylinder 11 or leading directly laterally from the trap-chamber, either of which constructions and others of an analogous and equivalent nature being within the scope of my invention.

I have provided three shelves or horizontal partitions 64, 65, and 66, mounted and spaced apart within the cylinder 11, the lowermost of said partitions being above the center of the cylinder. These partitions may be mounted in any desired way, and I have illustrated them as supported by brackets or angle-irons 67, fixed by studs or screws to the wall of the cylinder. These partitions should be provided with perforations 68 or apertures having a combined superficial area at least equal to the combined superficial area of the apertures in the top or cap plate 23 of the cylinder in which they are used. The perforations or apertures of the partitions 64, 65, and 66 are arranged out of alinement with each other, and it is the function of the partitions to limit and reduce the splashing of water within the cylinder and avoid in so far as it is possible to avoid the dashing of water into the pipes 29, 27, 25, and 57, or either of them, and at the same time permit the free passage of gas into and from the cylinder through passage-ways and courses provided therefor.

As a measure of protection to the cylinders I have provided a shield, support, or guard 69, preferably made of sheet metal and bent and shaped to surround the lower portions of the cylinder and extend downwardly therefrom approximately to the surface of the boiler on which the device is used. A wing or blade 69ª rises from the central portion of the guard or shield 69, between the cylinders 11 and 13, and extends nearly to the top thereof approximately parallel with the frame 10, and the upper end of said wing or blade is secured by studs to the cap-plates or covers of the cylinders. The central portion of the guard or shield 69 and the wing or blade 69ª thereof, acting in conjunction with the frame 10, provide a space or chamber between the cylinders through which heat may rise from the boiler and tend to keep the cylinders and contents thereof at a degree of temperature above the freezing-point. To aid in maintaining the desired temperature of the cylinders and their contents, I have extended a burner-pipe 70 from the service-pipe 25 downward between the cylinders and the bottom thereof and mounted a gas-burner on the lower end of said pipe. Immediately above the gas-burner and between the cylinders I have located a perforated deflecting-plate 71, arranged to receive and impede the escape of the heat generated by the burning of gas at the burner. The use of a small amount of gas at the burner beneath the deflector 71 will be sufficient to heat the air within the chamber in which said burner is located to the degree necessary to maintain a proper temperature of the cylinders and their contents. This arrangement of a gas-burner for the heating of the cylinders and the contents thereof is very desirable, since it sometimes occurs that the locomotive becomes "dead" out on the main line by reason of accident to some part of the machinery or the presence of snow-drifts, rendering it necessary to draw the water from the boiler and permit the escape of the accumulated steam. The headlight should be kept burning to warn the crew of an approaching train on ordinary duty or a rescuing party of the proximity of the dead locomotive, and to keep the headlight burning it is necessary to generate gas through the medium of the water supplied to the carbid-holder. Hence arises the desirability of a means for preventing the freezing of the water in the cylinders. For ordinary purposes when the engine is alive—that is to say, has its boiler supplied with the ordinary amount of steam—the cylinders may be kept at the proper degree of temperature by steam introduced to the cylinder 13 through the pipe 72, entering said cylinder and communicating with the boiler at any desired point. (Not shown.) The pipe 72 may be connected with the branch pipe of the injector and employed to fill the cylinder 13 if so desired.

The crank or handle 20 of the valve-plug 19 must of necessity be in the position shown in the drawings when the carbid-holder is in place for operation. I have thus provided said crank or handle to insure that communication between the cylinders 11 and 13 shall be established and not cut off at all times when the carbid-holder is in position for use.

I claim as my invention—

1. The combination of the air-tight cylinder, the perforated partitions therein and transversely thereof, which partitions occupy approximately parallel horizontal planes, a carbid-holder, water communication leading from the cylinder below the lowermost partition and opening to the carbid-holder, gas communication between the carbid-holder and the cylinder above the uppermost partition, service and safety pipes leading from said cylinder above the uppermost partition and an open cylinder and water communication between said cylinders.

2. The frame 10 suitably mounted, the cylinders arranged parallel with each other and fixed to said frame, the carbid-holder communicating with one of said cylinders, the gas and water pipes and the shield or guard surrounding the lower portions of the cylinders and provided with a member extending upwardly between the cylinders opposite to the frame, whereby a chamber is formed between the cylinders, and a gas-burner supplied by one of the cylinders and located within said chamber.

3. In an acetylene-gas generator, the combination of the mating cylinders, one air-tight and the other open to atmospheric pressure,

water communication between the bottoms of said cylinders, which communication is valvularly controlled, the generator arranged to receive water from one of the cylinders and supply gas to said cylinder, the service-pipe, the safety-pipe leading from the air-tight cylinder in and extending to near the bottom of the air-tight cylinder and provided with a safety-valve and the gas safety-pipe in the air-tight cylinder and provided with a pop-valve.

4. The combination of the cylinders, one air-tight and the other open to atmospheric pressure, water communication between the bottoms of said cylinders, which water communication is valvularly controlled, the generator arranged to receive water from the air-tight cylinder and supply gas thereto, the service-pipe, and the safety-pipe in and extending to near the bottom of the air-tight cylinder and provided with a safety-valve.

5. In an acetylene-gas generator, the combination of the mating cylinders, one air-tight and the other open to atmospheric pressure, the trap in one of the cylinders, the water-pipe leading from said trap to the other cylinder and valvularly controlled, the carbid-holder, the water-supply pipe leading from a cylinder, in a plane above the trap, to the carbid-holder, partitions transversely of the upper portion of the air-tight cylinder and formed with unalined perforations, the frame supporting the cylinders and the gas-pipes therefor.

6. The frame formed of a single plate with a curved foot or base arranged for attachment to a locomotive-boiler, the arms extending laterally from said frame above the curved foot, the hub formed on and connecting the extremities of said arms, the screw vertically seated in and extending through said hub, the cylinders fixed to said frame, the generator-cover fixed to said cylinders, the hanger on the generator-cover and formed with a vertical slot in its depending portion, the generator and the lug projecting radially from the upper portion of said generator and arranged to enter said vertical slot of the hanger, the generator being arranged to rest upon and be lifted by the screw into sealed contact with said cover.

7. The combination of the air-tight cylinder, the carbid-holder, the frustum-shaped pipe communicating with the air-tight cylinder at its larger end and extending horizontally outward therefrom, and arranged to convey water, the bore of said pipe being frustum-shaped, whereby water may flow back from the pipe to the cylinder, the needle-valve controlling the communication through the bore of said pipe, the pipe leading from the outer end of the first pipe to the carbid-holder and the gas-pipe affording communication between said carbid-holder and air-tight cylinder.

8. In an acetylene-gas generator, the combination of the mating cylinders, one air-tight and the other open to atmospheric pressure, water communication between the bottoms of said cylinders, the carbid-holder, the water-supply pipe leading from one of said cylinders to the carbid-holder, partitions transversely of the upper portion of the air-tight cylinder and formed with unalined perforations, the frame supporting the cylinders and the gas-pipes therefor.

9. The combination of the carbid-holder, the water-pipe entering the top thereof and the deflector located above the carbid in the holder, which deflector is concavo-convex in general formation, corrugated radially and provided with an aperture in its apex in alinement with the water-pipe.

10. The combination of the carbid-holder, the water-pipe leading into the top thereof, the concavo-convex deflector located with its convex face upwardly and its apex in alinement with the water-pipe, which deflector is formed with a central aperture and corrugations radiating from said aperture, which corrugations are of unequal length and arranged alternately.

11. The combination of the air-tight cylinder and pipe 52 formed with a frustum-shaped bore, communicating with said cylinder at its larger end, the pipe 54 leading laterally from the pipe 52 to a carbid-holder and formed with a tapering bore smaller at its outer end and the needle-valve controlling communication between the bore of the pipe 52 and the initial end of the bore of the pipe 54.

12. In an acetylene-gas generator, two mating cylinders, one an air-tight cylinder, the other an open cylinder, the bottoms of which cylinders are in approximately the same plane, the trap between the cylinders and leading from the bottoms thereof downwardly, in combination with a carbid vessel and connecting and service pipes therefor, said trap being provided with a drain and valve mechanism to establish communication between the cylinders and cut off the drain, or to establish communication between either or both of the cylinders and the drain.

13. An acetylene-gas generator, especially adapted to locomotive-headlighting, comprising two cylinders, one air-tight and the other open to atmospheric pressure, a carbid vessel, a pipe connecting the air-tight cylinder near its bottom to the carbid vessel, which pipe may admit water from the air-tight cylinder to the carbid vessel, a valve in said pipe, a communicating pipe connecting the bottom ends of the cylinders and arranged to convey water to and fro between the cylinders and also to serve as a trap to prevent the escape of gas from the air-tight cylinder to the open cylinder, a gas-conveying pipe leading from the carbid vessel into the top of the air-tight cylinder and a check-valve in the gas-conveying pipe.

14. In an acetylene-gas generator, a cylin-

der open to atmospheric pressure, an air-tight cylinder mating therewith, both of which cylinders have their bottoms in approximately the same plane, a water-trap formed in the bottom of the air-tight cylinder, a pipe communicating between the trap of the air-tight cylinder and the open cylinder, a carbid vessel located wholly below the bottoms of said cylinders, water communication between the air-tight cylinder and the carbid vessel, gas communication between the carbid vessel and air-tight cylinder and a service-pipe leading from the air-tight cylinder.

15. In an acetylene-gas generator, a cylinder open to atmospheric pressure, an air-tight cylinder mating therewith, the bottoms of said cylinders being in approximately the same plane, the bottom of said air-tight cylinder being concavo-convex in shape, a water-trap formed in and centrally of said bottom, a pipe communicating between the trap of the air-tight cylinder and the open cylinder, a carbid vessel located wholly below the bottoms of said cylinders, water communication between the air-tight cylinder and the carbid vessel, gas communication between the carbid vessel and the air-tight cylinder and a service-pipe leading from the air-tight cylinder.

16. In an acetylene-gas generator, a cylinder open to atmospheric pressure, an air-tight cylinder mating therewith, the bottoms of said cylinders being in approximately the same plane, the bottom of said air-tight cylinder being concavo-convex in shape, a water-trap formed in and centrally of said bottom, the bottom of said water-trap being concavo-convex in shape, a pipe leading from the center of the bottom of said water-trap and communicating with said open cylinder, a carbid vessel located wholly below the bottoms of said cylinders, water communication between the air-tight cylinder and the carbid vessel, gas communication between the carbid vessel and air-tight cylinder and a service-pipe leading from the air-tight cylinder.

Signed by me at Des Moines, Iowa, this 26th day of February, 1900.

GILES H. COOK.

Witnesses:
S. C. SWEET,
HARRY MUFFLEY.