No. 763,118. PATENTED JUNE 21, 1904.

S. RUSHMORE.

ACETYLENE GAS GENERATOR.

APPLICATION FILED DEC. 30, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

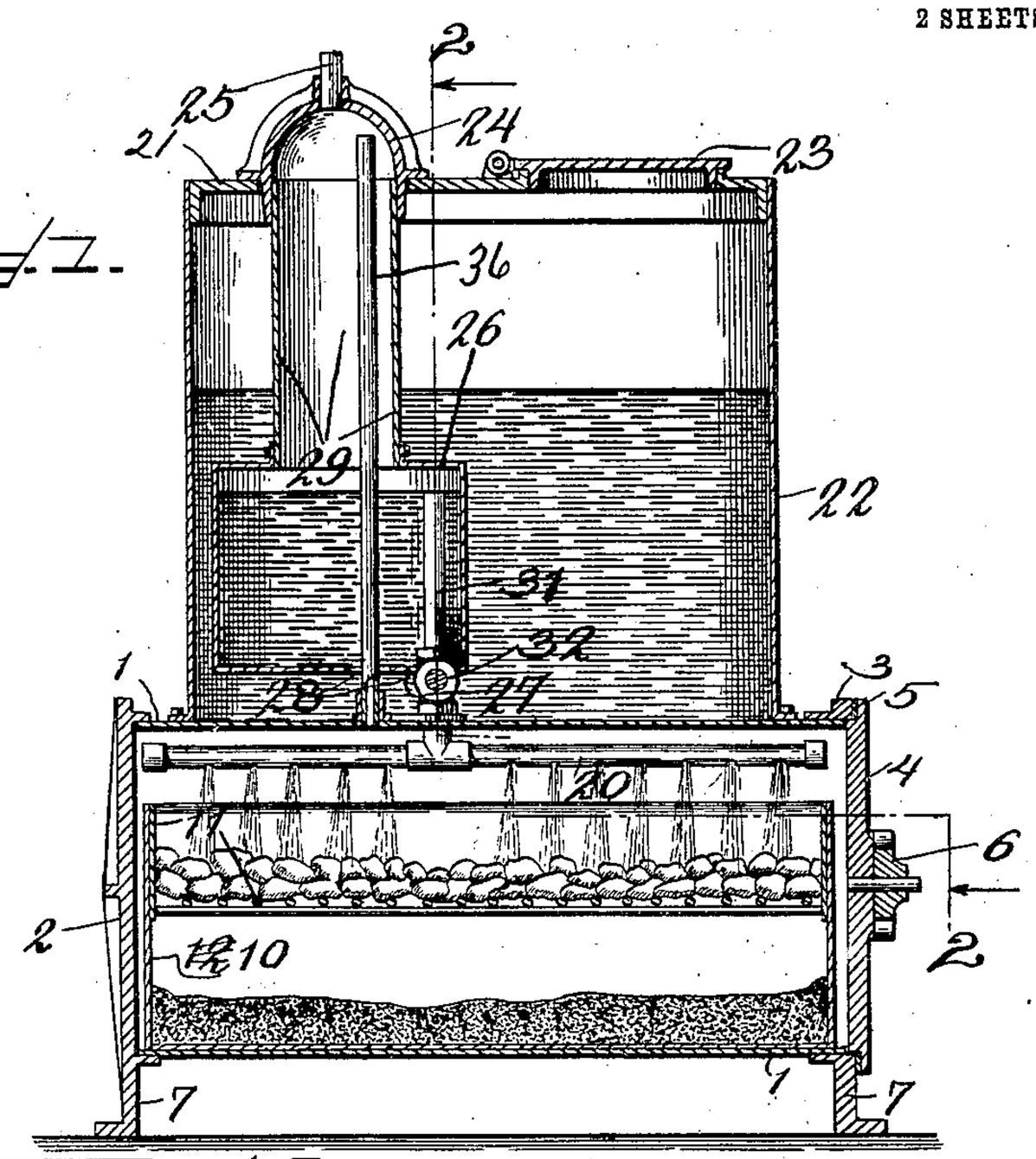
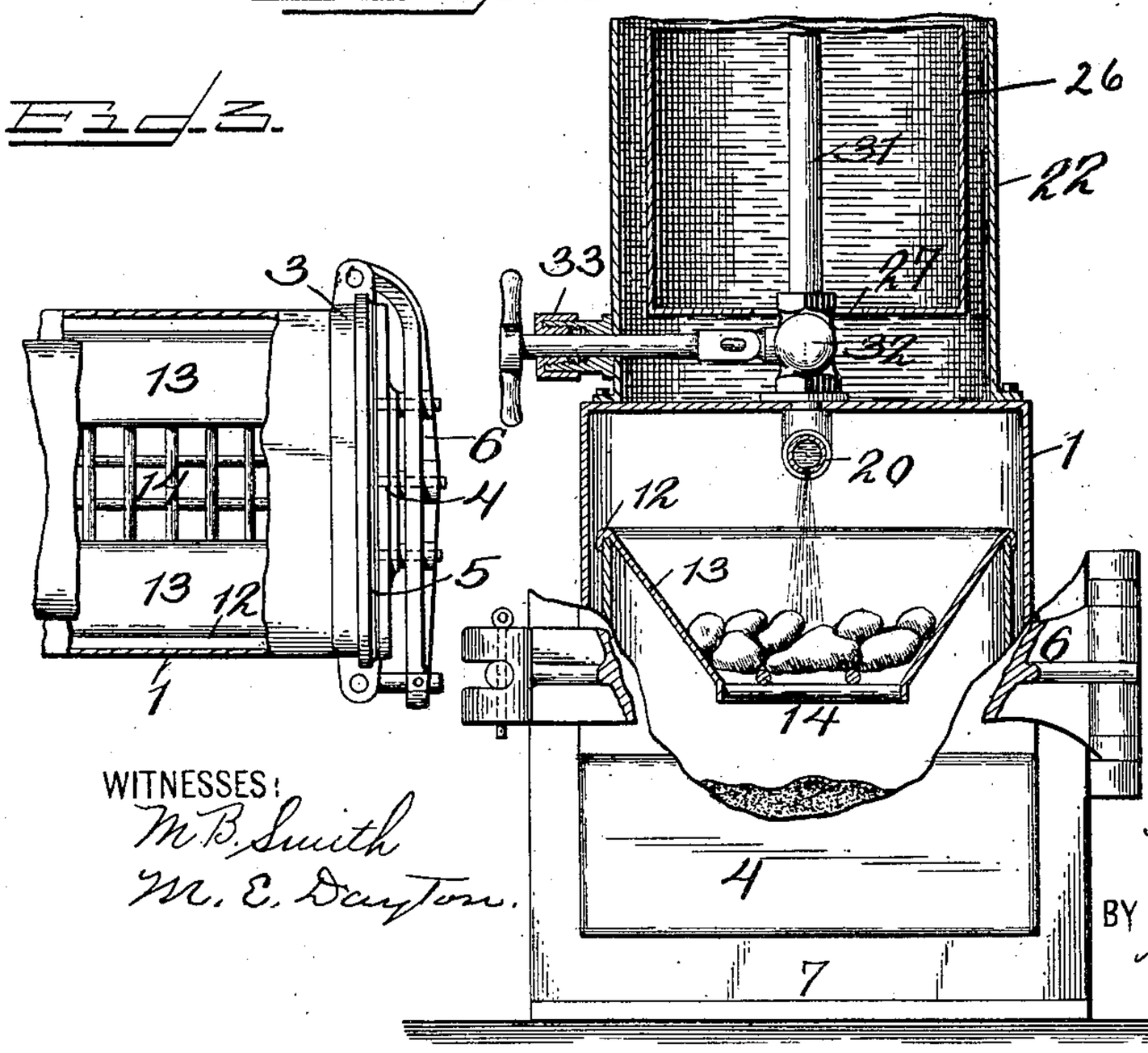


Fig. 2.



WITNESSES:
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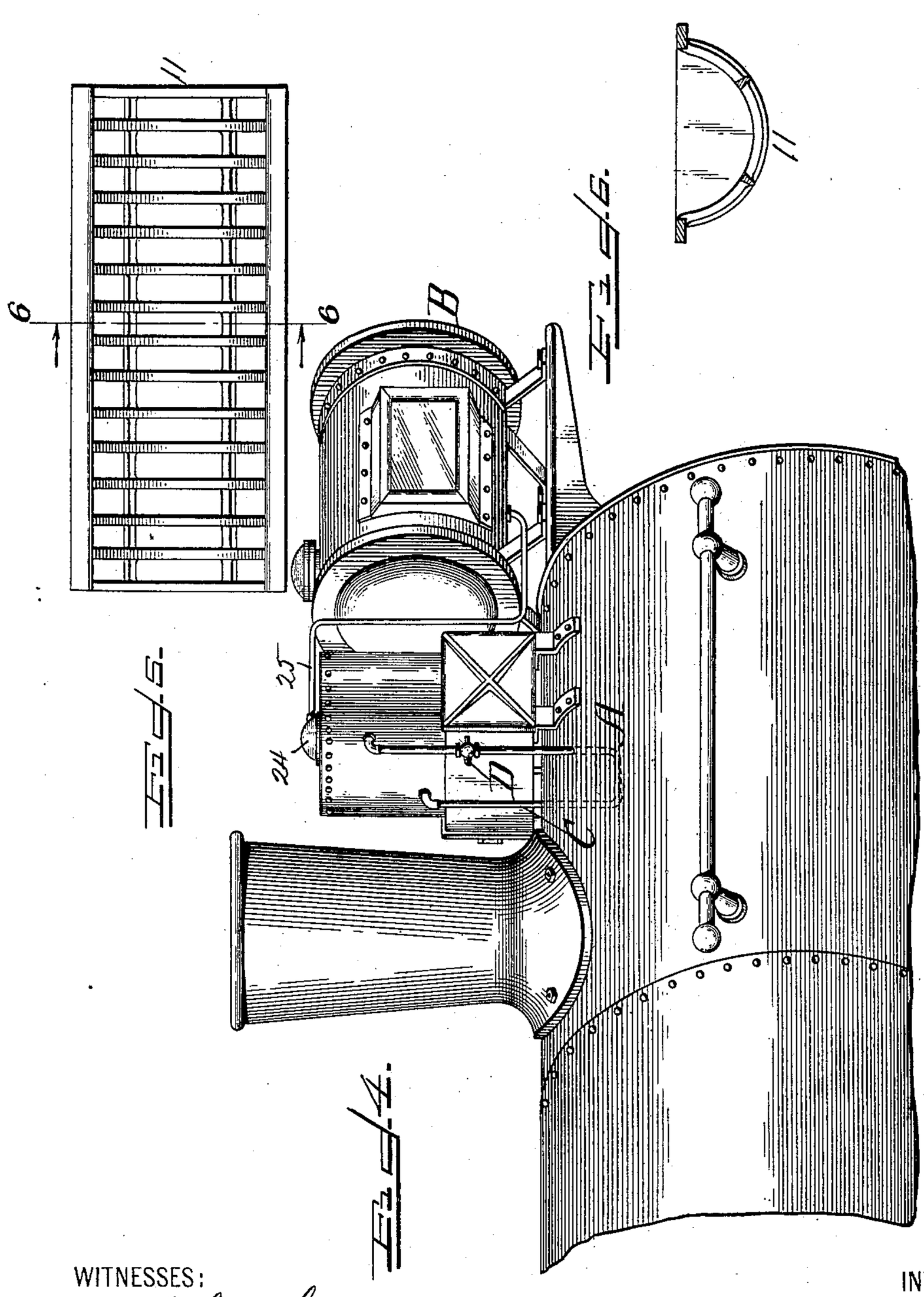

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

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No. 763,118. Patented June 21, 1904.

UNITED STATES PATENT OFFICE.

SAMUEL RUSHMORE, OF JERSEY CITY, NEW JERSEY.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 763,118, dated June 21, 1904.

Application filed December 30, 1902. Serial No. 137,117. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL RUSHMORE, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Acetylene-Gas Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to acetylene-gas generators for vehicles, and has for its object to provide a generator that shall automatically maintain the gas at a uniform pressure without complicated parts and mechanical movements and shall be adapted particularly for use on locomotives to supply gas for the headlight.

My invention will be understood by reference to the drawings herewith, in which the reference characters of the specification indicate the corresponding parts in all the figures.

Figure 1 is a vertical longitudinal section of my generator. Fig. 2 is a section on lines 2 2 of Fig. 1 with the upper portion broken away. Fig. 3 is a top plan with portions broken away, showing the carbid carrier or tray. Fig. 4 is an isometric view showing the position of the generator on the locomotive. Figs. 5 and 6 are respectively top plan and cross-section of a modification in the form of the carbid-carrier.

In the figures, 1 indicates the shell or case of suitable form, preferably rectangular; 2, a solid metal head forming one end of the case; 3, a ring fitted to the outer end of the case to which is hinged the door 4, provided with gasket 5 and locking mechanism 6, forming a gas-tight carbid-chamber supported on suitable legs 7, which may be integral with the cast-metal ends of the chamber or suitably connected thereto. Within the chamber is arranged a pan or waste-lime-receiving vessel 10, preferably rectangular in form and substantially filling the bottom of the chamber, on which is sustained a suitable tray, hopper, or carrier 11, as by its bent margin 12, engaging with the top of the pan, having inclined sides 13 and open-work bottom 14, formed of grating or cross-ribs for supporting the calcium carbid. Longitudinally arranged in the top of the chamber is a spray-pipe 20, by which the water is distributed and delivered with substantial evenness and regularity over the center line of carbid in the tray.

On the shell or case is carried the water-reservoir 22, suitably formed of sheet metal or otherwise, having, for instance, a cast-metal top 21, provided with a water door or gate 23, and a gas-dome 24, through which extends a suitable pipe 25 to the burner of the headlight. Within the reservoir in its lower portion is arranged the gas-receiving tank 26, into which the water passes freely but slowly through the small holes 27 28. From the larger tank the smaller connection 29 extends to the dome, forming a gas-space above the level of the water in the tank, which is there maintained substantially constant by the counteracting pressure of the water in the reservoir and the gas-pressure in the gas-receiving tank and chamber, as hereinafter described.

From the spray-pipe 20 there extends upwardly through the hole 27 into the tank the straight water-pipe 31, provided with suitable valve 32, extending outwardly through stuffing-box 33, said pipe terminating below the normal level of the water in the surrounding reservoir. From the carbid-chamber also extends upwardly into the gas space or dome the gas-pipe 36, whereby when the carbid is placed in the hopper and the valve 32 is turned, permitting the water to flow, the gas is generated and escaping upwardly into the gas-space forces the water down in the chamber below the upper end of the pipe 31, when the water ceases to flow and the generation of gas is stopped. As the gas is drawn through the pipe 25 for use in the burner the pressure is gradually diminished, and the water rises until it flows down through the water-pipe and the spray-pipe onto the carbid, whereby more gas is generated and the water again depressed in the tank. Thus when the gas is being used the level of the water in the tank will tend constantly to vary; but in practice this variation will be very slight, and practically there will be an almost constant but slight dripping of water upon the carbid. It will be seen that

owing to the smallness of the communicating holes in the bottom of the tank irregular pressure on the gas, as by splashing around of the water in the reservoir and vertical movement of vehicle, will be avoided. The gas-tank is made of larger size to give increased storage capacity, while the gas-space above it is made smaller in order not to reduce the water-space in the upper portion of the reservoir.

As the calcium carbid is slaked away the dust formed will be shaken down by the vibration of the moving locomotive through the grated bottom, and the unconsumed lumps of carbid will tend constantly to slip down the sloping sides and lie upon the grate in clean solid lumps, substantially under the spray-pipe, so that a single spray-pipe only is necessary. By this construction the advantages of a large supply of carbid are obtained without the necessity of dividing the spray-pipe up into two or more branches. Furthermore, by this construction the entire amount of water delivered onto the carbid is combined, insuring the complete slaking of the carbid without any waste of water, and this slaked lime is dropped into the pan below in the form of dry dust, which is more easily removed than the wet lime often formed in generators.

In Figs. 5 and 6 is shown a simple variation in the construction of the carbid-tray, the sides and bottom being a continuous grate formed by curved cross-bars, stiffened by longitudinal bars, if desired.

In Fig. 4 is shown the arrangement of my generator on a locomotive in which it is suitably supported on the smoke-box A immediately back of the headlight B. To the water-reservoir is connected at different levels two ends of a loop-pipe C, provided with a valve D. The lower closed loop of this pipe extends down into the smoke-box of the locomotive, where the products of combustion and fuel-gases heat the water, which by thermal circulation warms the water in the reservoir and prevents freezing in the coldest weather without the necessity of a steam-coil in the generator or other means of keeping it warm. This valve D is closed except in cold weather.

I do not limit myself to the method of heating the water by exposing a certain portion of it at a time to the heat of the waste gases or exhaust-steam; but I may arrange the external heating-pipe in such a way as to absorb heat from other parts of the locomotive.

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

1. In an acetylene-gas generator, the combination with a suitable carbid-chamber, of a removable carbid-tray arranged in the chamber, said tray having an open-work bottom and sides uniformly inclined from wider top to narrower bottom, a water-reservoir arranged above the chamber, a gas-receiving tank communicating therewith, a spray-pipe arranged in the chamber above the carbid, a water-pipe from the spray-pipe communicating with the tank, and a gas-pipe from the chamber to a gas-space in the tank above the end of the water-pipe for supplying the generated gas from the chamber to the tank, and an outlet-pipe from the upper portion of the tank to the burner, substantially as and for the purposes set forth.

2. In an acetylene-gas generator, the combination with a suitable gas-tight carbid-chamber, of a waste-lime-receiving vessel arranged therein, a removable carbid tray or carrier supported in the vessel, a spray-pipe having a series of outlets arranged in the top of the chamber above the carbid, a water-reservoir supported immediately above said chamber, a gas-tank arranged within the water-reservoir and having one or more openings in its lower portion communicating with the reservoir, a water-pipe extending from the spray-pipe into the gas-tank and terminating below the level of the water in the reservoir, a gas-pipe extending from the chamber into the tank and terminating in a gas-space therein above the end of the water-pipe and above the water in the tank, and an outlet from said gas-space to the burner.

3. In an acetylene-gas generator for vehicles, the combination with a suitable gas-tight metallic shell forming a carbid-chamber, of a suitable waste-lime-receiving vessel arranged therein, a carbid-tray having inwardly and downwardly sloping sides and an open-work bottom supported in said vessel, a water-reservoir supported on the shell, a gas-tank arranged in the reservoir and connected thereto by openings in its base, a gas-space above the water in the tank, a gas-supply pipe connected to the space, of a spray-pipe having a series of openings arranged in the chamber above the carbid, a water-pipe extending upwardly from the spray-pipe into the tank and terminating therein below the level of the water in the reservoir, a valve in said water-pipe, a second pipe extending from the chamber upwardly into a gas-space formed in the upper portion of the gas-tank, and means to conduct the gas from the gas-space to the burner.

4. In an acetylene-gas generator, the combination with a gas-tight shell forming a carbid-chamber, of means for suitably supporting the carbid therein above its bottom on an open-work support, of a water-reservoir supported on the shell, a gas-dome arranged in the top of said reservoir, a gas-outlet pipe from the gas-dome to the burner, a gas-tank arranged in the lower portion of the reservoir provided with one or more small openings in its base to form water communication with the reservoir, a connection between said tank and dome forming a gas-chamber of smaller size than the tank, a spray-pipe extending longitudinally in the chamber above the carbid and provided with water-outlet openings, a water-pipe extend-

ing from the spray-pipe upwardly into the tank and terminating therein below the level of the water in the reservoir, a valve in said water-pipe, and a gas-pipe extending upwardly from the carbid-chamber into the dome or the gas-chamber.

5. In an acetylene-gas generator, the combination with a rectangular shell forming a carbid-chamber, of a gas-tight door at one end of said shell, a waste-lime-receiving vessel arranged in the chamber; a carbid-carrier having inclined sides and an open-work base supported on or above said vessel; a water-reservoir arranged on the shell, a gas-dome arranged in the top of said reservoir, a gas-outlet from the gas-dome to the burner; a gas-tank arranged in the lower portion of the reservoir and provided with one or more small openings in its base to form water communication with the reservoir, a connection between said tank and dome forming a gas-chamber of smaller size than the water-tank; a spray-pipe extending longitudinally in the chamber above the carbid and provided with water-outlet openings, a water-pipe extending from the spray-pipe upwardly into the gas-tank and terminating therein below the level of the water in the reservoir, a valve in said water-pipe, and a gas-pipe extending upwardly from the carbid-chamber into the dome or gas-space.

6. In an acetylene-gas generator for locomotive-headlights, the combination with the locomotive smoke-box, of a metallic case forming a carbid-chamber supported upon or adjacent to the smoke-box, means for supporting the carbid in the chamber, a water-reservoir arranged on the case, means for delivering the water gradually onto the carbid, a loop of pipe connected to the water-reservoir at two points and having its closed intermediate portion extending into the smoke-box and a valve in said pipe.

7. In an acetylene-gas generator for locomotives, the combination with a carbid-chamber and water-reservoir, means to support the carbid in the chamber, a pipe to conduct the water from the reservoir to the carbid in the chamber, and a pipe connected to the reservoir at two points and extending into the smoke-box of the locomotive, for the purpose of heating the water.

8. An acetylene-gas generator for locomotives having a metallic case forming a carbid-chamber and a water-reservoir, said case being adapted to set on the smoke-box, a pipe for conducting the water from the reservoir to the chamber, and a loop of pipe connected to the reservoir at both ends and extending into a heated part of the locomotive.

9. In an acetylene-gas generaator for locomotive-headlights, the combination with the locomotive smoke-box and the headlight suitably supported thereon, of a metallic case forming a carbid-chamber supported on the smoke-box immediately behind the headlight, means for supporting the calcium carbid in the chamber, a water-reservoir arranged on the case, means for delivering the water gradually onto the calcium carbid, a loop of pipe connected to the water-reservoir at two different heights and having its closed intermediate portion extending downwardly into the smoke-box and a valve in said pipe.

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

SAMUEL RUSHMORE.

Witnesses:
M. B. SMITH,
M. E. DAYTON.