(No Model.)

L. SERRES.

LAMP FOR GENERATING ACETYLENE GAS.

No. 599,198. Patented Feb. 15, 1898.

Fig. 1

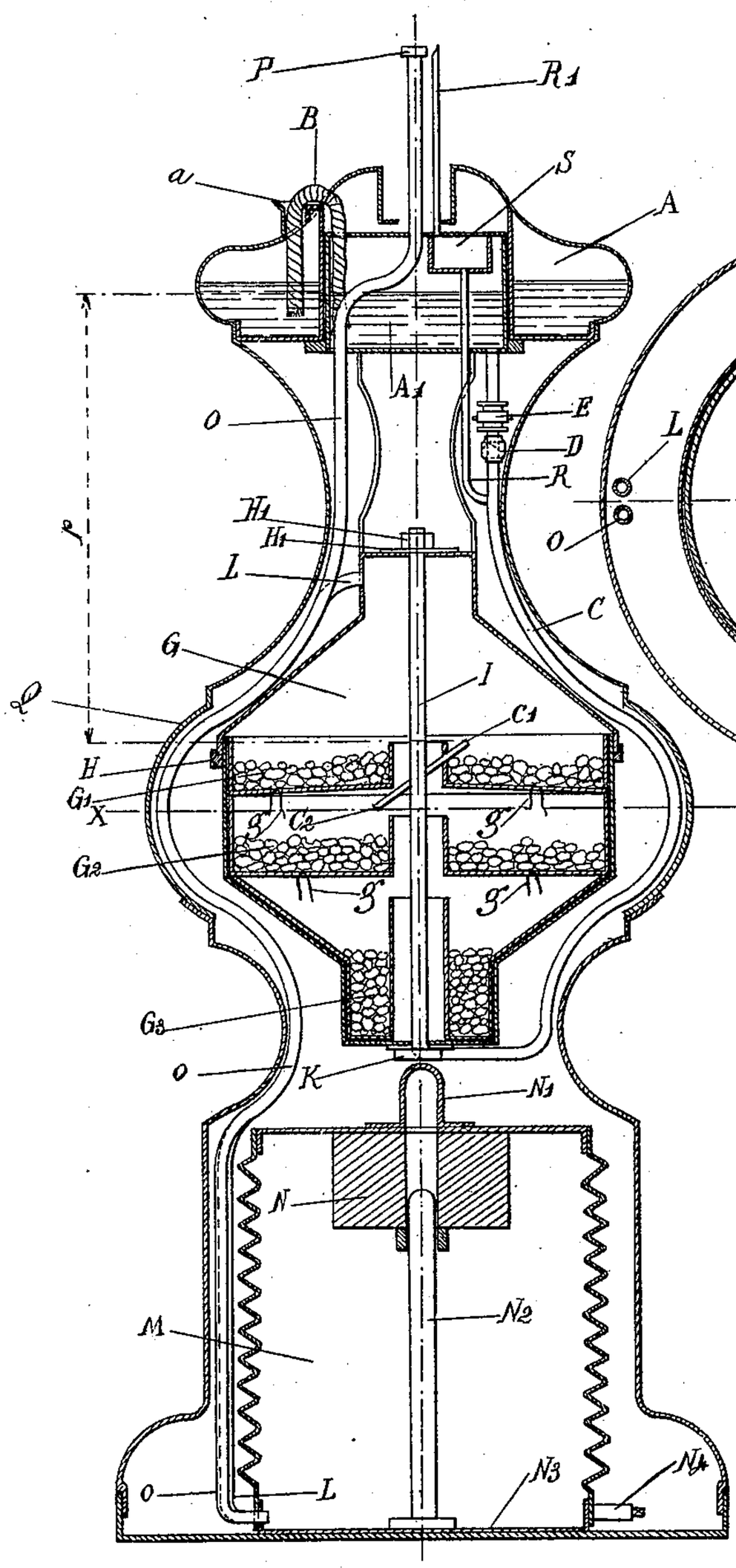
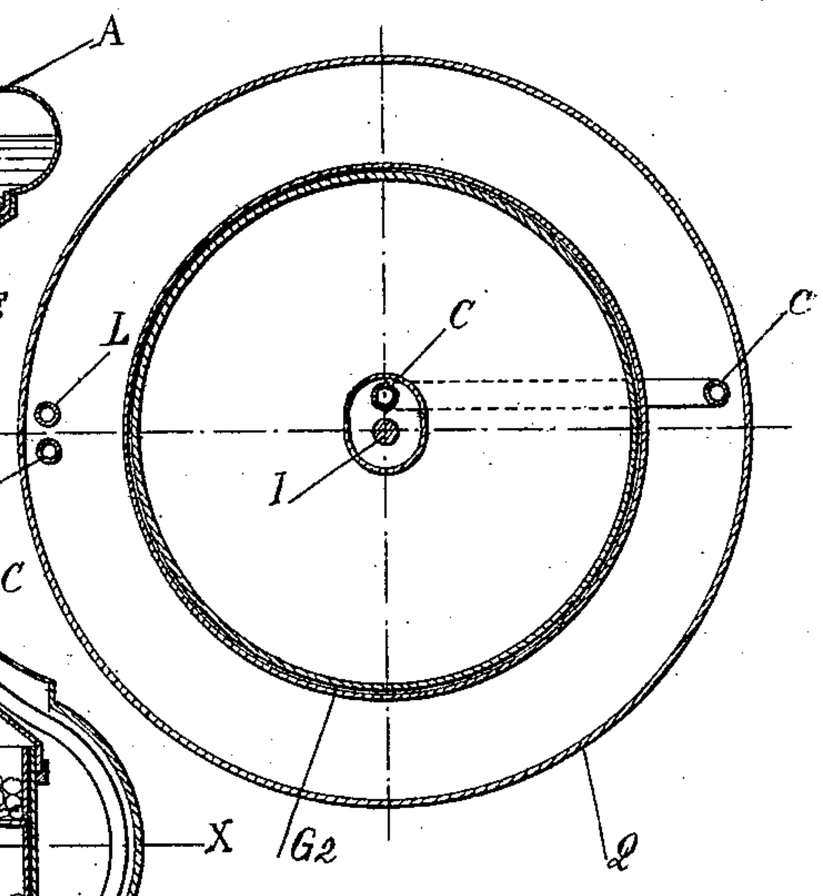


Fig. 2



WITNESSES

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LAMP FOR GENERATING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 599,198, dated February 15, 1898.

Application filed December 29, 1896. Serial No. 617,366. (No model.)

To all whom it may concern:

Be it known that I, LÉOPOLD SERRES, a citizen of the French Republic, residing at Condat-sur-Vézère, France, have invented certain new and useful Improvements in Lamps for Generating Acetylene Gas; 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.

The present invention relates to a portable lamp for acetylene gas embodying its own gas-generator and gasometer. The water-receptacle placed in the upper part of the lamp allows the water to pass under pressure into the carbid-chamber, which is divided into several compartments placed one above the other, so that the admission of water is arrested as soon as the gas-pressure is equal to the corresponding height of the column of water. The water-pipe is provided inside of the carbid-chamber with two branches having openings at different heights, so that one supplies water to the upper chamber while the other supplies water to the lower chamber. The gas developed in the generator is led from the top of the same into a gasometer of an expansible form, such as a bellows, which is arranged below in the foot of the lamp. This gasometer increases in volume in proportion to the quantity of gas developed in the apparatus and the inside pressure will be proportional to the weight of the parts forming the bellows, and this inside pressure may be increased by providing a weight on the top plate of said bellows.

Figure 1 of the accompanying drawings is a vertical section through the middle of the lamp embodying my invention. Fig. 2 is a horizontal section on line X X, Fig. 1.

The water-reservoir A has an opening *a*, through which water may be supplied, which passes into a second independent reservoir A′, arranged in the middle of the reservoir A by means of a wick B, which draws the water from A to A′ in the manner of a siphon. Thus the level in the reservoir A′ is approximately constant and the supply of water through a pipe C of small diameter (not more than one-fourth of an inch) will be under a pressure of little or no variation. A check-valve D is arranged in this pipe C to prevent the passage of gas through said pipe should the inner pressure of the gas become higher than that of the water-column. A cock E is adapted to allow the water in reservoir A′ to flow through the pipe C, respectively to check it, when the lamp should not burn. The pipe C brings the water into the gas-generator G. This generator is divided into several superposed compartments, three being shown in the drawings. The pipe passes up through the middle of the bottom and allows the water to escape through the orifices C′ C^2, which are not at the same level. This arrangement is of the greatest importance for obtaining a perfect regularity of the light. The effect of the difference of pressure will easily be understood in considering that the pressure on the two orifices C′ C^2 is equal to that of the column of water from each orifice. When the pressure of gas at a given moment is equal to that corresponding to the water-pressure from the orifice C′—as, for instance, indicated by *p* in the drawings—no water will escape through said opening C′, while through the opening C^2 some drops will still escape.

When the pressure of gas increases in the apparatus, the supply of water will be cut off in both orifices, and when the pressure diminishes—that is, becomes lower than *p*—both orifices will give out water. Thus at the slightest difference of pressure more or less water will flow out, and the equilibrium will be easier reëstablished than if there were one orifice only for the supply of water. The admission of water is almost constant and remains always proportional to the pressure in the gasometer. Consequently the flow of gas will also remain constant, and therefore the flame will never vary, for there will always be an equilibrium between the gasometer and the pressure of the gas developed by the regulated quantity of water which automatically wets the calcium carbid.

Practice has demonstrated that the pressure is absolutely constant, for the gasometer remains inflated for about three-fourths and is motionless during the whole period of producing light. The gas-generator G is closed everywhere, and it is composed of three cups G′ G^2 G^3, thus forming three compartments, offering a great surface of contact with the water and diminishing the inconvenience of

the formation of crusts of lime, which prevent contact with the water. The bottoms of these cups are perforated to allow the water to pass downwardly and to allow the gas to pass upwardly. For a better distribution of the liquid, threads *g g* are disposed in these perforations, so that the water passes down drop by drop. The generator G is closed by a cap jointed to the lower part by means of a rubber ring H. This cap and the lower part are united by means of a rod J, passing through the center of the same and having at the bottom a column K and at the upper end a nut H′. The developed gas passes down through a tube L into the gasometer M. The side walls of the latter are made of rubber, leather, or other flexible material, and the top is provided with a weight N, being perforated in the center and carrying above the perforation a prolongation formed by a cylindrical cap N′. Thus the weight N can be guided on a vertical rod N^2, which is rigidly secured to the bottom of the lamp at N^3.

Suppose the weight N has a certain number of pounds so that the inner pressure at 1.3 atmospheres will be able to lift it. The same pressure will prevail in the apparatus as long as the reservoir can expand and the weight can travel to the upper end of its stroke. When the weight cannot travel any farther and the volume of the reservoir cannot increase the inner pressure in the apparatus by overdevelopment, the gas will increase, and then the water-supply will be automatically cut off, as hereinafter explained; but as long as the weight is in equilibrium, supported by the inner pressure, the latter will of course remain constant, which is essential for the production of a quiet flame.

The gasometer is at its bottom provided with a screw-plug N^4 to permit of its opening, so that water accumulated therein may be led off from time to time. The gas from the gasometer passes up to a burner P through a tube O, (which conceals in the drawings the tube L, which leads the gas down.) The whole apparatus is inclosed in an envelop Q of any desired form. I prefer to make it in two principal parts, the upper of which carries the water-reservoir A, which may be taken off easily, so as to allow cleaning and refilling of the cups $G' G^2 G^3$, to which access is easy when the nut H′ is unscrewed.

Although the gas can be developed in the generator only in proportion to the consumption, and consequently all danger of explosion and of overproduction is theoretically impossible, nevertheless the pipe C is provided with a branch R, which leads to a box S, having on its top a small pipe R′. If now an overproduction of gas should occur, the reservoir M having reached its maximum of expansion, the water in the pipe J will be pressed back by the gas and will be forced upward in a body in the leg C.

Having thus described my invention, I claim—

1. A lamp for burning acetylene gas having in the top near the burner a water-reservoir inclosing a separate inner water-reservoir and having a wick connecting both reservoirs, the end in the inner reservoir hanging lower down than the other end in the outer reservoir, in the middle a gas-generator comprising several superposed cups containing the calcium carbid, said cups being suitably perforated to allow free passage to the water and to the ascending gases, said gas-generator being connected with the water-reservoir by a water-supply pipe having a stop-cock and a check-valve and passing up through the center of the bottom of the gas-generator, adapted to supply water into the same by openings at different levels, one moistening one compartment and the other moistening another of the compartments, and having in the lower part a flexible gasometer connected with the gas-generator by a pipe and by a separate pipe with the burner, substantially as described.

2. A lamp for the consumption of acetylene gas having in the top near the burner a water-reservoir, in the middle a gas-generator and connected with the water-reservoir by a water-supply pipe, said water-supply pipe being provided with a check-valve and below said valve with a branch tube, and an exhaust-tube leading to the burner a closed reservoir being interposed between said branch tube and exhaust for allowing water thrown back by excess of pressure to close said valve and to gather in said closed reservoir and to allow the excess of gas to escape through the water accumulated in said closed reservoir toward the burner and having in the lower part a flexible gasometer connected with the gas-generator by a pipe and by a separate pipe with the burner substantially as described.

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

LÉOPOLD SERRES.

Witnesses:

CHILLAND OLFRED,

COMPOSIEUR JEAN.