No. 794,078. PATENTED JULY 4, 1905.

L. S. BUFFINGTON.

ACETYLENE GAS GENERATOR.

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Fig. 1.

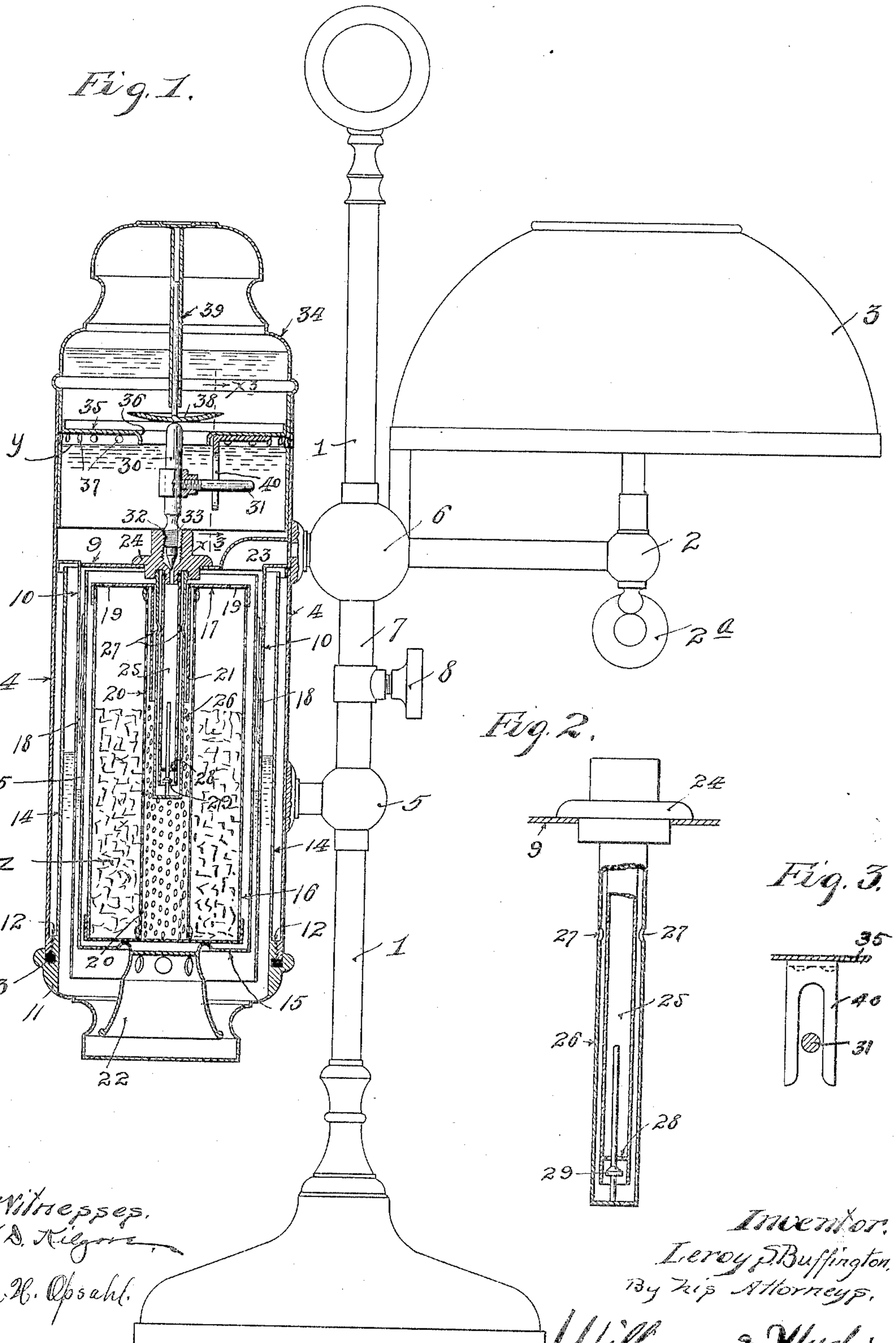

Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

LEROY S. BUFFINGTON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE NORTHERN LIGHT COMPANY, OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF MINNESOTA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 794,078, dated July 4, 1905.

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To all whom it may concern:

Be it known that I, LEROY S. BUFFINGTON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, 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 present invention relates to acetylene-gas generators, and has for its especial object to provide an improved acetylene-gas lamp.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view, partly in elevation and partly in vertical section, showing an acetylene-gas lamp of the type known as "student's" lamp and in which are incorporated the several features of my present invention. Fig. 2 is a detail, on an enlarged scale, partly in elevation, but principally in section, showing the so-called "manifold" water-feeding tube; and Fig. 3 is a detail in section on the line x^3 x^3 of Fig. 1.

The lamp illustrated is almost identical in appearance with an ordinary so-called "student's" lamp, and in the parts of the lamp, the numeral 1 indicates the vertical standard, the numeral 2 the burner, the numeral 3 the shade, the numeral 4 the cylindrical shell of the generator, and the numerals 5 6 bearings rigidly secured on said cylinder and loosely fitting on the rod of said standard. The bearing 6 is hollow and forms a part of the gas-delivery passage between the generator and the burner 2.

The numeral 7 indicates a sleeve which is adjustably mounted upon the rod of the standard 1 between the bearings 5 6 and is provided with a set-screw 8 for holding it wherever set.

The cylinder 4 is divided into an upper and a lower compartment by a horizontal partition 9, which is formed with a depending cylindrical flange 10, which is extended concentrically, but spaced apart from the depending portions of the cylinder 4. The lower end of the cylinder 4 is normally closed by a cap-like bottom 11, which has screw-threaded engagement therewith at 12, a pliable gasket 13 being placed between the joints of the said parts. The bottom 11 is provided with a cylindrical flange 14, which telescopes into the annular space formed between the cylinder 4 and depending flange 10, thus dividing the said annular compartment into an inner and outer annular portion having communication over the upper edge of the said flange 14.

Frictionally held within the depending cylindrical flange 10 is a carbid-holder, shown as made up of the cylindrical cup 15, interior cylinder 16, and heads 17. The cup 15 has spring-fingers 18, which engage the inner surface of the flange 10 to frictionally hold the carbid-holder in working position. The heads 17 telescope frictionally onto the ends of the cylinder 16, and the upper head is provided with perforations 19 for permitting the escape of gas. Out of the carbid-holder proper into the compartment formed within the cylindrical flange 10 a perforate tube 20 is preferably placed axially of and within the cylinder 16 between the heads 17, and the upper head 17 has a central perforation and the centrally-depending sleeve 21, which telescopes loosely into the upper end of the said perforated sleeve 20. As shown, the cylindrical cup 15 is formed with a depending knob or hollow finger-piece 22, by means of which it may be readily removed from working position or placed in working position. A gas-delivery port 23 opens from the top of the generating-chamber through the partition 9 into the gas conduit or bearing 6 and from thence to the burner 2. The burner 2 has a valve 2^a, by means of which the gas may be turned on or off at will.

At the center of the partition 9 is a small

valve-seat casting 24, from which depends a pair of concentric tubes 25 and 26. The outer tube 26 is closed at its lower end and is provided at points far above its bottom with water-escape passages 27. In the lower end of the inner tube 25 is a restricted water-passage 28, through which works the stem of a check-valve 29, which check-valve is normally held open by gravity, but is adapted to be closed by an initial backward flow of the feed-water. The valve-seat casting 24 is provided with a central water-feed pipe leading into the upper end of the inner tube 25 and adapted to be opened and closed by a needle-valve 30. The needle-valve 30 has a radial arm 31 and has screw-threaded engagement with the casting 24 at 32, and its threads are slotted at 33 to permit the water to be fed through said screw-threaded engagement to the conical point of the valve.

Fitting telescopically into the open upper end of the cylinder 4 is a water-supply cup or auxiliary reservoir 34. Above its open lower end this reservoir 34 is provided with a horizontal partition 35, having at its center a downturned neck or flanged opening 36. Just below the partition 35 the walls of the reservoir 34 are perforated at 37, so as to permit air to leak in just below said partition. When the reservoir or cup 34 is lifted from working position, the neck-opening 36 is closed by a valve 38, the stem of which works loosely in a sleeve 39, depending from the top of said reservoir. When the said reservoir is placed in working position, as shown in Fig. 1, the check-valve 38 is forced into an open position by its engagement with the upper end of the needle-valve 30. Also at this time the prongs of a bracket 40, depending from the partition 35, embrace the arm 31, so that the valve 30 may be opened and closed by rotary movements of the reservoir or cup 34.

It is of course an easy matter to fill the reservoir or cup 34 with water when it is removed from working position and turned upside down. The primary water-compartment is formed in the upper portion of the cylinder 4 above the partition 9, and this compartment should be partly filled with water while the cup or reservoir 34 is removed. When the filled cup or reservoir is placed in working position, as shown in Fig. 1, and its valve 38 is opened, water will run therefrom into the main water-compartment until the water reaches the level indicated by the line *y* in Fig. 1, at which time it closes the lower end of the neck 36, cuts off the supply of air to the closed chamber of said reservoir 34, and thereby stops the further discharge of water therefrom. As soon, however, as the water in the main compartment falls below the line *y* air is admitted into the closed compartment of the reservoir 34 through the neck 36 and water is again allowed to flow therefrom into the main water-compartment. By this means the auxiliary supply of water is caused to automatically keep up the head of water in the main water-compartment, so that a constant pressure of feed-water is rendered available. The water discharged into the inner water-feed tube 25 will fill up the lower end of the outer feed-tube 26 so as to entirely submerge the check-valve 29 and will overflow through the perforations 27 and will run down the outer sides of said outer tube and drop to the bottom of the perforated tube 20. The feed-perforations 27 are protected from the direct action of the carbid and of the carbid residue by the depending sleeve 21 and, further, by the perforate sleeve 20. Any overgeneration of gas which is sufficient to generate a pressure greater than that of the feed-water will cause a backward flow of the feed-water and immediately close the check-valve 29, thereby stopping a further backward flow of the water, preventing the escape of gas, and of course for the time being holding back a further supply of water from the generating-chamber.

To form a water-seal between the relatively fixed and relatively movable parts of the generating-chamber, water is placed in the removable bottom 11. This water when the parts are put together, as shown in Fig. 1, will rise partly between the depending cylinder 10 and the cylindrical cup 15 and partly between said cylinder 10 and the cylindrical flange 14. Under increasing gas-pressure from within the generating-chamber the inner annular column of water just noted is caused to lower, while the outer annular column is caused to rise and to compress the air above the same and between the cylindrical flange 14 and cylindrical shell 4. A combined water and air cushion is thus provided for relieving the pressure of the generated gas.

It will of course be understood that the device described—to wit, the combined generator and burner—is capable of many modifications within the scope of my invention as herein set forth and claimed. In fact, the principal feature of this invention relates to gas-generators, and hence it is evident that these features may be incorporated in a great many different kinds of generators.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a generator of the character described, the combination with a shell having an elevated water-compartment and a generating-chamber located below the same and in communication therewith through a restricted water-feed passage, of a needle-valve coöperating with said restricted passage and provided with a projecting arm, a rotatively and removably mounted auxiliary water-reservoir normally closing the upper

end of said shell and communicating with the water-chamber thereof, and a bifurcated bracket carried by said auxiliary water-reservoir and normally straddling the projecting arm of said needle-valve whereby said needle-valve may be opened and closed by rotary movements of said auxiliary reservoir, substantially as described.

2. In a generator of the character described, the combination with a shell having an elevated water-compartment and a generating-chamber located below the same and in communication therewith through a restricted water-feed passage, of a valve coöperating with said passage, a rotatively-mounted auxiliary water-reservoir free also for vertical movement located in the upper end of said shell and communicating with the water-chamber thereof through a valved passage, the valve of which is normally held open by the before-noted feed-valve, and a connection between the said feed-valve and said auxiliary water-reservoir whereby said feed-valve may be opened and closed by rotary movements of said reservoir.

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

LEROY S. BUFFINGTON.

Witnesses:
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