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J. J. HENDLER.

ACETYLENE GAS APPARATUS.

APPLICATION FILED MAY 8, 1901.

NO MODEL.

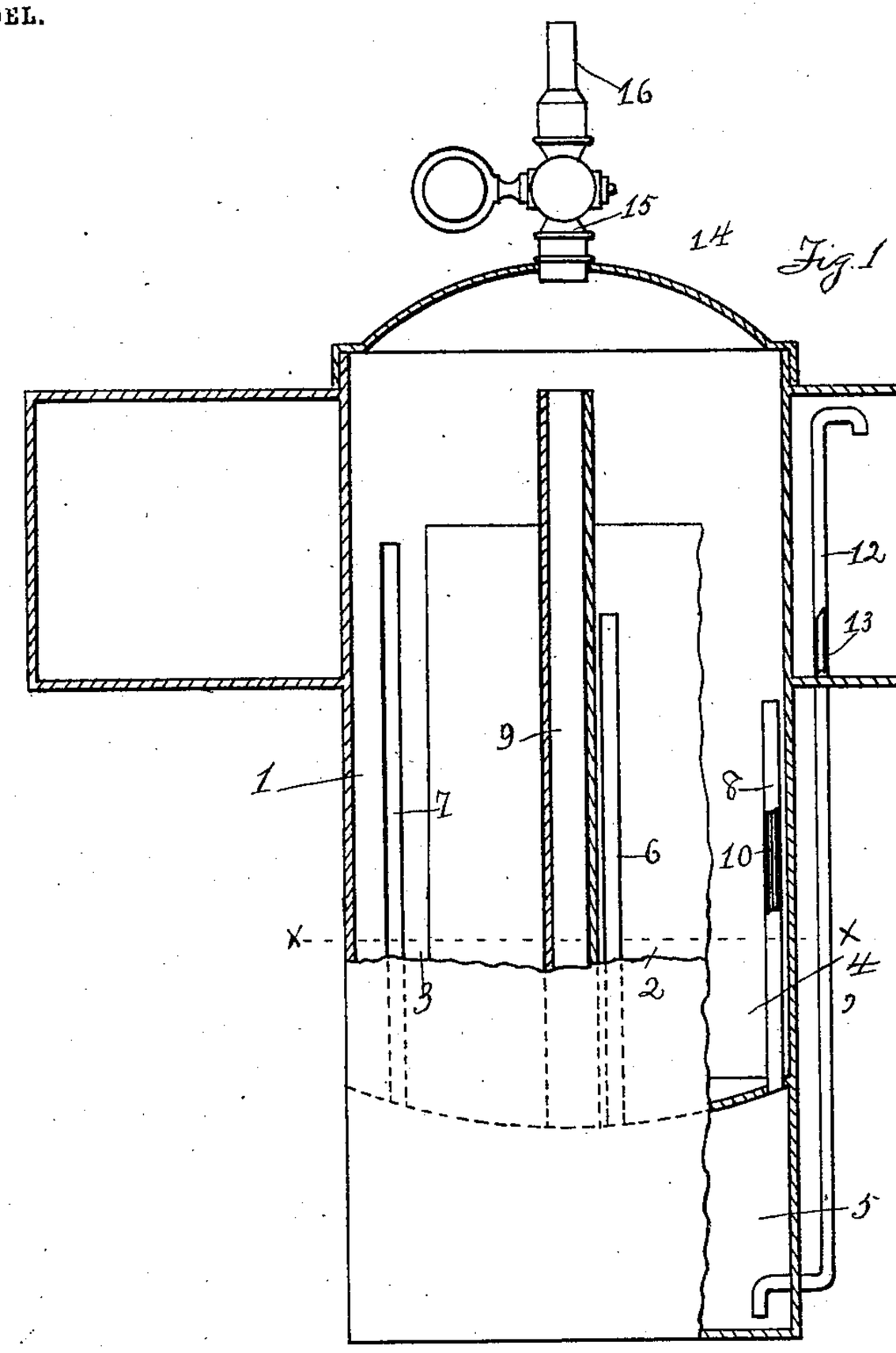

Fig. 1

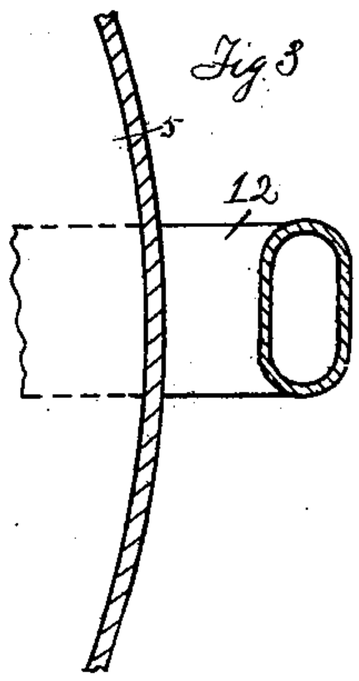

Fig. 3

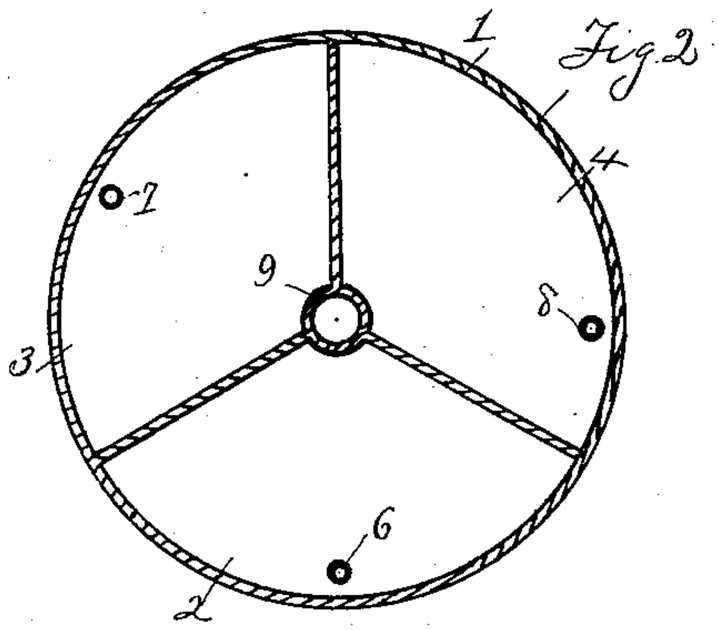

Fig. 2

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No. 729,339. Patented May 26, 1903.

UNITED STATES PATENT OFFICE.

JOHN J. HENDLER, OF KANSAS CITY, MISSOURI.

ACETYLENE-GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 729,339, dated May 26, 1903.

Application filed May 8, 1901. Serial No. 59,275. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. HENDLER, a citizen of the United States, residing at Kansas City, in the county of Jackson, in the State of Missouri, have invented certain new and useful Improvements in Acetylene Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in acetylene apparatus, having more particular relation to improvements in the apparatus for which Letters Patent were issued to me February 12, 1901, No. 667,774, and also in the apparatus set forth and described in my application for Letters Patent Serial No. 50,565, filed March 11, 1901; and my invention consists in certain features of novelty hereinafter described, and set out in the claims.

Figure 1 represents an elevation, partly in cross-section, of my improved apparatus. Fig. 2 represents a horizontal section on the line *x x* of Fig. 1. Fig. 3 represents a detail view, somewhat enlarged, of the pipe by which the water-reservoir is connected with the gas-storage chamber and water-chamber.

Similar numerals refer to similar parts throughout the several views.

1 represents a generating-chamber, which may be divided into compartments 2, 3, and 4. Under said generating-chamber is provided a chamber 5, which acts successively as a water-chamber and a gas-storage chamber and communicates with said generating-chamber through the water-tubes 6, 7, and 8 and the gas-tube 9. Said gas-tube extends nearly to the top of the generating-chamber. Said water-tubes are arranged one in each of the compartments of the generating-chamber, are of small caliber, and the water passage through the same is diminished and the flow of water therethrough restricted by the insertion of a wire 10 therein, said wires being retained in the tubes by bending over at the top of the tube, as shown, and the several tubes successively increase in length, so that the carbid in one compartment will be flooded and exhausted before the water will reach and overflow in the compartment of the next taller tube. This is the preferable construction, though it is manifest that in an apparatus of small size to supply a limited demand to construct the chamber without such compartments and with a single water-tube substantially the same results would be reached.

A water-reservoir 11 is mounted upon the upper part of the generating-chamber, and a pipe 12 communicates with the storage-chamber 5 near the bottom thereof and extends toward the top of said reservoir. A restricted inlet-opening 13 is provided in said pipe near the bottom of the reservoir, which opening is small compared with the size of the pipe.

The generating-chamber is closed by a cap 14 and has a valved outlet 15 through said cap, with which may be connected a burner 16, or tubing may be connected thereto and the gas conducted to any desired point.

The carbid is preferably placed in the generating-chamber in sacks 18, as the residuum of decomposition may thus be more readily removed.

In operation the carbid is placed in the generating-chamber or the several compartments thereof and the water in the reservoir, the reservoir being filled nearly full, or to such height as not to overflow into pipe 12. The water runs from the reservoir through the opening 13 into pipe 12 and through said pipe into the water-chamber 5, and, filling said chamber, passes up through the tubes 6, 7, and 8, and said tubes being successively of greater height the water will first overflow from the shorter tube and the carbid in that compartment will first be decomposed and the gas generated therefrom until the carbid in said compartment is exhausted. As the gas is generated and the pressure in the generator increases, the pressure will stop the flow of water through the tube and force the water back through the tubes into the water-chamber and the gas will flow through the tubes into said chamber; but the tubes 6, 7, and 8 are of too small caliber to permit the passage of the gas with sufficient rapidity to properly and safely relieve the pressure due to the rapid generation. Hence the gas-tube 9 is provided for the passage of the gas under pressure into the water-chamber, which for the time becomes a storage-chamber for the gas. As the generation of gas continues from

the action upon the carbid of the water already admitted, the increasing volume of gas under pressure will force the water from the storage-chamber up the water-supply pipe 12, and the opening 13 in said pipe being too small to afford an outlet for the water under pressure of the gas the water will be forced up and will overflow from the top of pipe 12 and the chamber 5 will act as a storage-chamber for the gas. Then the further generation of gas having been checked by the forcing away and cutting off the supply of water and the outlet-valve being open, as the gas flows out the pressure will decrease and the water will return to the water-chamber and again rise through the water-tubes and overflow upon the carbid. By thus arranging the water-tubes the water overflows therefrom and collects in the bottom of the compartment, and the decomposition of the carbid will begin at the bottom, whereby a more complete decomposition of the carbid is effected than when the water drips upon the carbid, or in any other system in which the decomposition begins at the top, and this by reason of there not being a protecting coating of lime formed over the carbid to prevent the water reaching it; and, further, with such arrangement of the water-tubes when the pressure of the gas cuts off the flow of water through the tubes the water already in the compartment remains and the decomposition and generation of gas continues, the water admitted flooding the carbid to a certain height and being sufficient in quantity to prevent overheating and burning the carbid or the formation of an impervious coating so conducive to waste as well as danger by leaving a quantity of undecomposed carbid to be thrown out with the residuum, where it may be the cause of a dangerous explosion, and by the arrangement of the gas-tube to convey the gas to the storage-chamber or gasometer all danger of excessive pressure and overheating is removed; but if any excessive pressure should arise beyond the control of the water in pipe 12 the gas will escape through pipe 12 and a vent-hole 17 in the reservoir.

It will be observed that the inlet-opening 13 in pipe 12 is of such size as to permit an inflow of water substantially equal to the outflow of the gas through valved outlet 15, so that the pressure of the water in the reservoir through said inlet-opening at no time acts as an active pressure upon the gas, and by reason of such arrangement, after the overflow from pipe 12, under pressure of the gas, ceases, a constant and uniform pressure of the gas is maintained.

A further function of tube 6—that is, the tube supplying water from the gas and water chamber 5 to the carbid in the generating-chamber—is interesting to be observed. It is apparent that when the water rises in and overflows from the top of tube 6 the water in the pipe 9 will rise to the level of the top of said tube 6, a condition which to a material degree prevents overheating of the generator and the carbid therein. It is also apparent that the water will rise in pipe 12 to the same level as in pipe 9, and then as the water is admitted through tube 6 to the carbid and the gas generated the water will be held back by the gas-pressure and will rise in pipe 12 until it stands at the same level as the water in the reservoir, so that the water-pressure to which the gas is subjected and acting as a pressure to distribute the gas through the service-pipe to the burners is measured by the height of the water in the reservoir. Hence it follows that the height of the tube 6, or of the point of admission of the water from the gas and water chamber 5 to the carbid, above the bottom of the generating-chamber, will regulate the water-pressure and pressure of the gas at the burner, for if the tube 6 be short or the point of admission to the generating-chamber be low down, but a small amount of water will pass from the reservoir to raise the water in tube 6 till it overflows to the carbid, and a higher column of water will stand in pipe 12 to exert its pressure upon the gas, while if tube 6 be a tall tube, or the point of admission of the water be high up toward the top of the generating-chamber a larger quantity of water must flow from the reservoir to raise the water to the point of admission to the carbid, and a lower or shorter column of water will stand in pipe 12 to exert its pressure upon the gas, and thus if a high pressure be desired, adapted to a painter's or plumber's blow-pot, by making tube 6 short—that is, the water-inlet to the carbid low down—such pressure may be obtained, or if a lower pressure be desired, suitable for lighting purposes, such pressure may be obtained by increasing the height of tube 6—that is, the water-inlet to the carbid—the pressure being regulated by the height of tube 6—that is, of the water-inlet above the bottom of the generating-chamber; and here it is necessary to observe that when the generating-chamber is divided into compartments each having a separate water-tube the difference in height of such tubes should be very slight in order that the difference in water-pressure due to the difference in height of the tubes may not result in undue variation of the gas-pressure at the burners as the compartments successively come into action. Furthermore, by the arrangement of tube 6 providing a restricted inlet for the water above the bottom of the generating-chamber, the apparatus is rendered self-regulating and automatic to accommodate the supply of gas to the demand, for if ten or more burners be supplied by the service-pipe and the gas at one of such burners be lighted the relief to the pressure by the escape of gas at such single burner will be slight and the amount of water admitted to the generating-chamber will be correspondingly small, but sufficient for the generation of gas to maintain the supply, while if the gas be lighted at ten or any number of burners the relief to the pressure will be correspondingly increased, permitting

the admission of a larger quantity of water for the generation of the larger supply of gas necessary to meet the demand, in either case a constant and uniform supply of gas being maintained at the burner or burners under uniform pressure.

As the effective operation of the apparatus is not affected by any jolting or jarring short of overturning, this apparatus is particularly adapted for use for locomotive-headlights, bicycle-lamps, and other places where such jolting and jarring are experienced.

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

1. An acetylene-gas apparatus comprising a casing divided into a generating-chamber and an underlying gas and water chamber, an imperforate pipe tapping the bottom wall of said generating-chamber and communicating at its lower end with said gas and water chamber, means in said pipe for restricting the flow of water through said pipe, and means for supplying water under pressure to said gas and water chamber, substantially as set forth.

2. An acetylene-gas apparatus consisting of a casing divided into a generating-chamber and a gas and water chamber, a connection between said generating-chamber and said gas and water chamber for supplying water to said generating-chamber, a pressure-pipe connecting said chambers, a water-reservoir supported by said casing, and a pipe connecting said water-reservoir with said gas and water chamber, said pipe having a free and a restricted communication with the water in said reservoir; substantially as described.

3. An acetylene-gas apparatus consisting of a generating-chamber comprising a plurality of carbid compartments, a gas and water chamber, connections between said generating-chamber and said gas and water chamber for supplying water severally to said compartments, means affording free passage of the generated gas from said generating-chamber to said gas and water chamber, and a water-reservoir, communicating with said gas and water chamber for supplying water under pressure thereto; substantially as set forth.

4. An acetylene-gas apparatus consisting of a generating-chamber comprising a plurality of compartments, a gas and water chamber, connections between said generating-chamber and said gas and water chamber for supplying water severally and at different water-levels to said compartments, means affording free passage of the generating-gas from said generating-chamber to said gas and water chamber, and a water-reservoir communicating with said gas and water chamber for supplying water-pressure thereto; substantially as set forth.

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