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J. E. SHEARER.

PROCESS OF CARBURETING AIR OR GAS.

(Application filed Nov. 11, 1899.)

(No Model.)

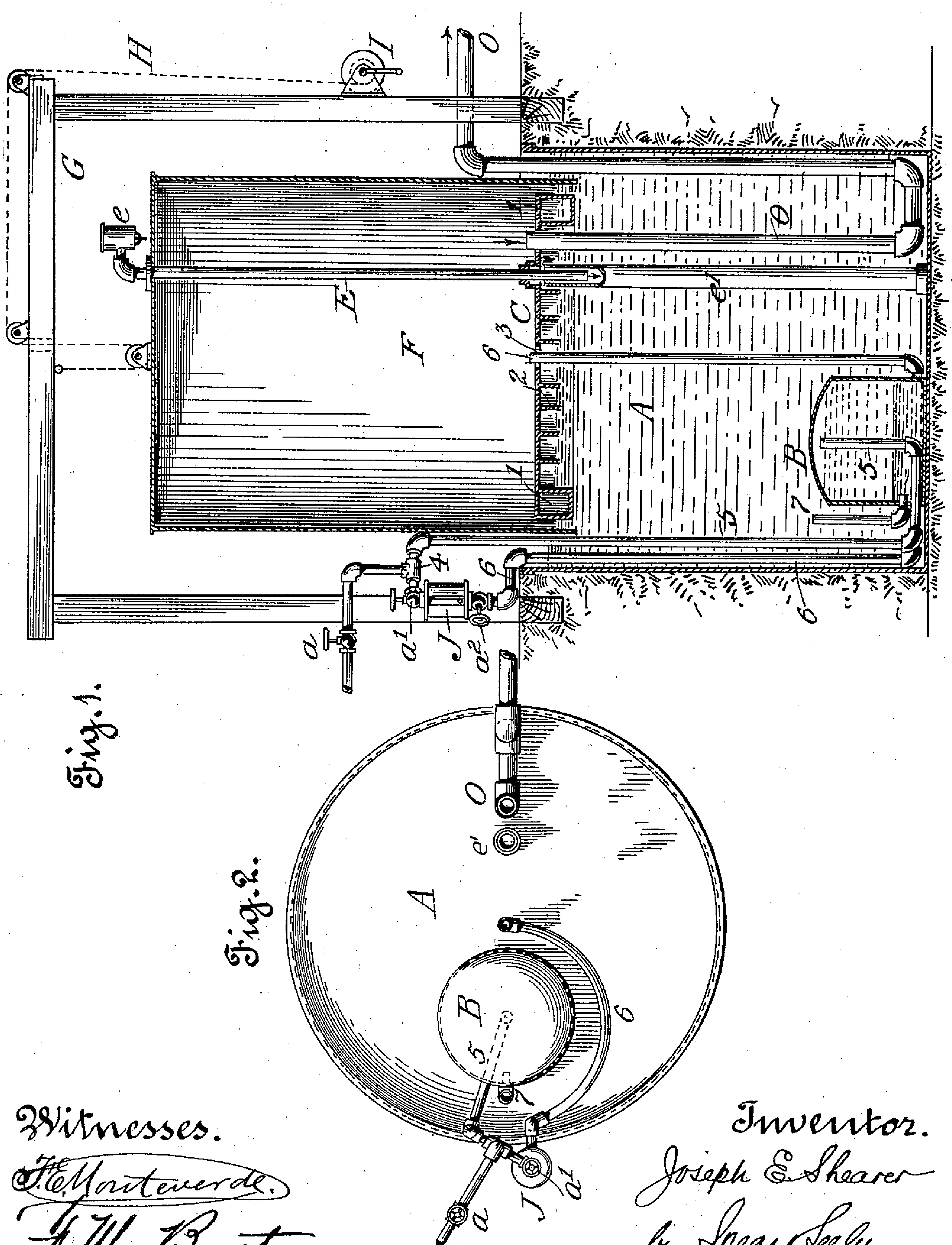

Fig. 1.

Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOSEPH E. SHEARER, OF CHICO, CALIFORNIA, ASSIGNOR TO JOHN C. BURDON, OF SAME PLACE, AND JOHN GLANVILLE, OF SACRAMENTO, CALIFORNIA.

PROCESS OF CARBURETING AIR OR GAS.

SPECIFICATION forming part of Letters Patent No. 656,484, dated August 21, 1900.

Application filed November 11, 1899. Serial No. 736,608. (No specimens.)

To all whom it may concern:

Be it known that I, JOSEPH E. SHEARER, a citizen of the United States, residing at Chico, in the county of Butte and State of California, have invented certain new and useful Improvements in Processes of Making Gas, of which the following is a specification.

My invention relates to a process for carbureting air to produce a gas suitable for illuminating and heating.

One part of my process relates particularly to the use of water-pressure for elevating and isolating a small body of gasolene or other carbureting substance from a larger body of such substance immersed in the water which produces such pressure.

Another part of my process relates to the manner of filling the immersed oil-tank by forcing the oil into such tank, displacing the water primarily contained therein, and then by the back pressure of water raising a part of the gasolene above the main water-level and the carbureting-point, so that it can feed by gravity to the carbureting-point.

Another part of my process relates to the production of a vacuum above the carbureting-point, by means of which air is drawn into contact with the carbureting fluid.

My objects are to economize the carbureting fluid, to maintain its quality and standard, to insure its substantially-equable temperature at all seasons, to prevent chilling, and thus to avoid the use of heat in carbureting, to insure safety in the use of highly-inflammable fluids, to make evaporation complete by making it possible to insure the proper relative proportions of gas and air, and in general to improve carbureting processes as heretofore carried on.

Different kinds of apparatus can be employed for carrying out my process; but I prefer to use the apparatus described in an application for Letters Patent, Serial No. 736,609, filed upon the same day as the present case. I have illustrated in the accompanying drawings enough of such an apparatus to enable the operation of my process to be perfectly intelligible.

Figure 1 is a vertical section of the whole apparatus. Fig. 2 is a bottom plan of the carbureter.

In carrying out my process I admit gasolene or other suitable fluid which is lighter than water into a tank contained within another and larger tank which is filled with water. The inner tank is accessible to the entrance of the water which surrounds it. I prefer to let the inner tank fill with water and then force gasolene in, displacing the water; but if the admission of water is controllable the gasolene can be admitted to the inner tank in the first place and then such tank opened to admit water. The pressure of water forces gasolene from the inner tank upwardly to a point above the water-level and so above a carbureter floating upon the water. At the point mentioned a small quantity of gasolene is measured and supplied to the carbureter by gravity. The air to be carbureted is drawn in by forming a sufficient vacuum above the water-level and carbureter and is compelled to pass through the carbureter in contact with the oil, which rests in a thin stratum on the surface of the water in which the carbureter floats. The means for producing this vacuum also forms a gas-holder, into which the carbureted air flows from the carbureter and from which it can be drawn off for lighting, heating, and other purposes.

A represents the main tank, which is preferably buried in the ground and is filled with water. These features make a double precaution for the safety of the hydrocarbon-tank B, which is placed within tank A and rests upon its bottom, the tank B being first protected by the water in which it is immersed and also by the burial of tank A in the ground. The supply of gasolene or other hydrocarbon by which air is carbureted is only indirectly derived from this tank, and the carbureter is wholly disconnected from the main gasolene-supply in a manner which insures the absolute safety of the apparatus. I prefer to use gasolene as the carbureting agent, but do not limit myself to that substance.

The carbureter C floats on the surface of the body of water in tank A. Such floating carbureters have been employed before in cases where the main tank was filled with the carbureting agent. Such a construction is highly dangerous, as it calls for the practical disclosure of a large body of explosive fluid. I consider it a marked and special improvement to employ a body of water for submerging the gasolene-tank and also for supporting the carbureter. The carbureter which I prefer to use consists of a disk having a hollow rim 1, which forms an air-space and makes it buoyant. Secured to the disk on its lower side is a flange 2, of helical shape, which forms a continuous helical passage from the edge to the center. When the carbureter is in position, the edge of this flange dips into the water, so as to form a continuous water-sealed passage of the shape described and shown. The disk is provided with a central opening 3.

An inverted tank or bell F is supported from a suitable framing G by a rope or cable H, which extends to a windlass I, provided with an ordinary ratchet device for holding the bell in suspension. The bell is shown in elevated position in Fig. 1, which is the operative position in which it acts as the gas-holder. Before commencing to make gas the bell is lowered into the main tank. Communicating with the interior of the gasolene-tank B is another open-ended pipe 7, into which water from the main body flows and fills the tank B. Gasolene is forced from any external source of supply through a pipe 5, which passes down inside the main tank and has an upturned open end within the inner tank B. This gasolene entering under pressure displaces the water in tank B, which is forced back into the main body of water through pipe 7, leaving the tank B wholly or partly full of gasolene. When the gasolene-pressure is cut off by the cock *a*, Fig. 1, the water-pressure is exerted upon the gasolene in tank B by water entering through pipe 7 and displacing the gasolene, which rises in pipe 5, and gasolene being about one-third lighter than water it will rise in pipe 5 to a height above the water-level equal to about one-third of the depth of water. Pipe 5 communicates through a branch 4, provided with a cock a', with the elevated measuring vessel J, preferably of glass, above the water-level and carbureter. This vessel holds a regulated quantity in proportion to the size of the plant, and this isolated quantity is the direct supply for the carbureter. From the vessel J a pipe 6 leads downwardly into the main tank and up through the body of water to the central opening 3 of the carbureter, which is larger than the upturned open end of said pipe 6. Pipe 6 has a cock a^2, which is closed while cock a' is open. When the desired quantity of oil is in the vessel J, cock a' is closed and cock a^2 opened. The gasolene will now feed by gravity through pipe 6, will escape at its upper end, and will fall through opening 3 into the passage of the carbureter, through which it spreads, resting in a thin body or stratum upon the water and leaving a clear passage above it. The absolute safety with which the supply, storage, and subsequent feeding of the inflammable material have been conducted and the isolation of the small quantity used in the carbureter will have been apparent to the reader. I now have a thin body of carbureting fluid resting on a body of water and forming the base of a continuous air-passage. I supply air and at the same time form a gas-holder by raising the inverted tank or bell which has been dipping in the water and is made air-tight. The act of raising the bell forms a vacuum above the water-level and carbureter, and the air to fill this vacuum is compelled to pass through the carbureter before entering the gas-holder.

E is an air-pipe passing air-tight into the bell and having an exterior air-valve *e*. Its lower end passes air-tight into the carbureter and enters a larger stationary tube e' in the main tank, whose upturned end leaves a space for the escape of air into the air-passage of the carbureter. The tube e' is of course necessary in order to permit air to be discharged at any height of the bell and at any point above the water-level. The pipe E and air-valve move with the bell. The air escaping from tube e' enters the air-passage and is drawn through its whole length in contact with the body of gasolene. The air-pipe connects with this passage at its extreme outer end, and hence the air follows the helical winding of the passage until at the central opening 3, and thoroughly carbureted it rises into the gas-holder. I consider the helical form of the air-passage of great advantage as compared to one of square or other angular shape, as insuring a more rapid and easy passage of the air, there being no corners to produce obstructions.

The gas-outlet pipe O is an open-ended pipe extending from the gas-holder through the carbureter down into the main tank and then upwardly, as shown, whence it leads to the lighting system. This arrangement of the outlet gas-pipe prevents any interference with the movable bell or gas-holder.

The placing of the oil-tank under water and at the bottom of the main tank insures its safety and also maintains the gasolene at a practically-even temperature at all seasons. From the same position of the oil-tank I am able to use the water-pressure for displacing and forcing the gasolene out of the tank into the measuring-tank, water entering the gasolene-tank to replace the oil forced out. This operation is under complete control by means of the cocks shown, so that the exact amount of gasolene required to make a given quantity of gas can be isolated from the main body. The gasolene is always confined in tanks or pipes and never handled in the open, so that it is safe to operate the machine at night with a light. The amount supplied to the carbureter can also be perfectly regulated, so that there is no danger of waste by evaporation or spilling.

The isolation of a small and perfectly-regulated quantity of gasolene is a marked improvement as distinguished from processes involving evaporation and carbureting from the main body of oil. In the latter case the standard of the gasolene is reduced by evaporation. Further, in evaporation from a large body of liquid it soon becomes chilled, making subsequent evaporation imperfect. By my process perfect gas is made without using heat. The gasolene being in such a thin stratum in the carbureter, the chilling effect is not noticeable on account of the short time required to charge the plant. As only the required amount of gasolene is run into the carbureter each time and just before the air is admitted, there is no trouble from local evaporation, which would produce a waste of oil, excessive richness of gas, and smoky lights. Furthermore, the gas being made by producing a vacuum, and the capacity of the bell which produces it being known, the exact quantity of air in cubic feet to be admitted can be determined relatively to the amount of oil admitted to the measuring-can, insuring complete evaporation and a standard gas, and the quantity of gasolene remaining in the storage-tank B is always definitely known.

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

1. In a process for making gas, the method of supplying oil to a carbureter floating upon a body of water, which consists in forcing oil into a tank immersed in said body of water, cutting off the oil-supply, displacing oil from said tank and raising it above the water-level by admitting water to said tank, and then feeding said oil by gravity to said carbureter.

2. The process of making gas, which consists in supplying oil of specific gravity inferior to water to a tank immersed in water, causing the pressure of such water to displace and elevate oil from such tank to a height above the water-level, then feeding such oil by gravity to a carbureter at the water-level, producing a vacuum above the water-level and thereby drawing air into said carbureter and over the body of oil contained therein.

3. The process of making gas, which consists in forcing oil of specific gravity inferior to water into a tank immersed in a body of water and accessible thereto, cutting off the oil-supply, so as to permit the back pressure of water into said tank to displace and elevate oil therefrom to a height above the water-level, then feeding such oil by gravity to a carbureter at the water-level, producing a vacuum above the water-level, and thereby drawing air into said carbureter and over the body of oil contained therein.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 13th day of October, 1899.

JOSEPH E. SHEARER.

Witnesses:

C. H. PORTER,

A. J. MCLENAN.