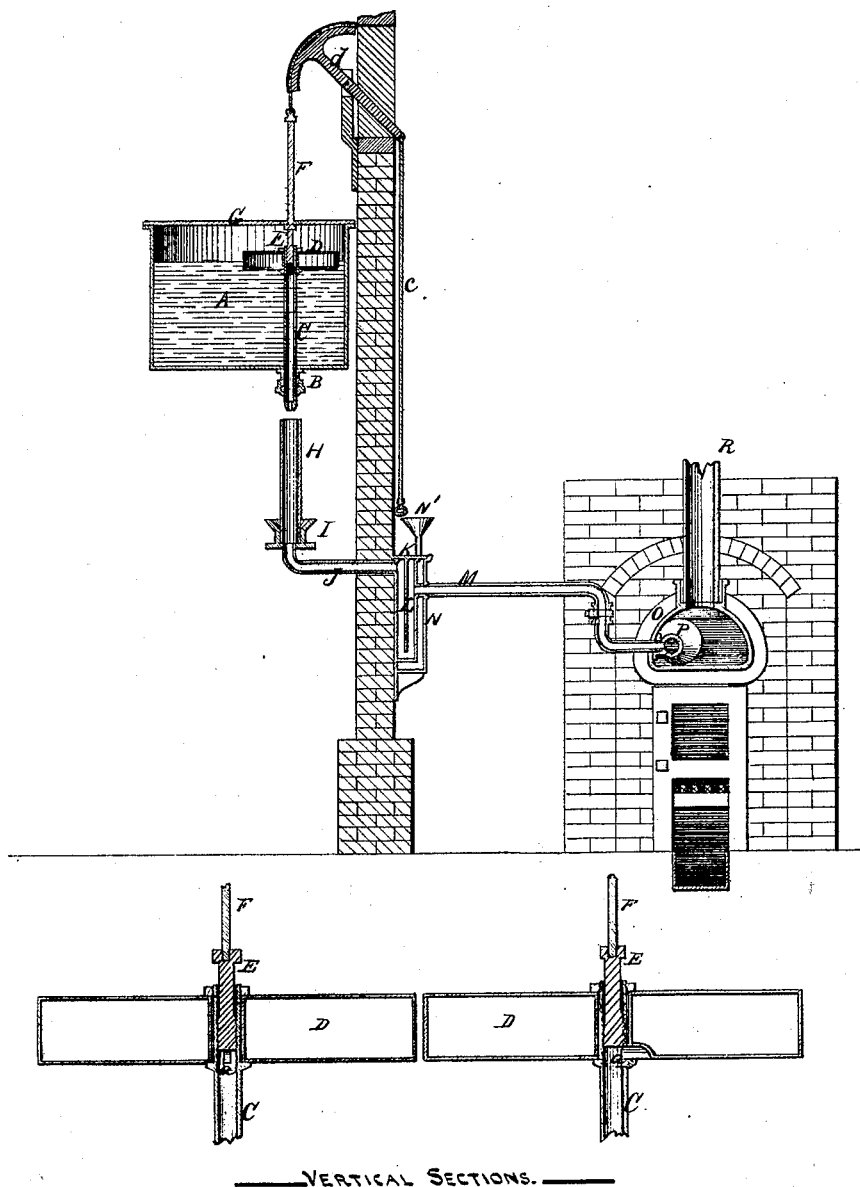


J. R. Smedberg, 2, Sheets, Sheet 1.

Manf. Hydrocarbon Gas.

No. 109,460

Patented Nov. 22. 1870.



Witnesses.
Geo. H. Strong
G. Fitzgerald

Inventor.
James R. Smedberg

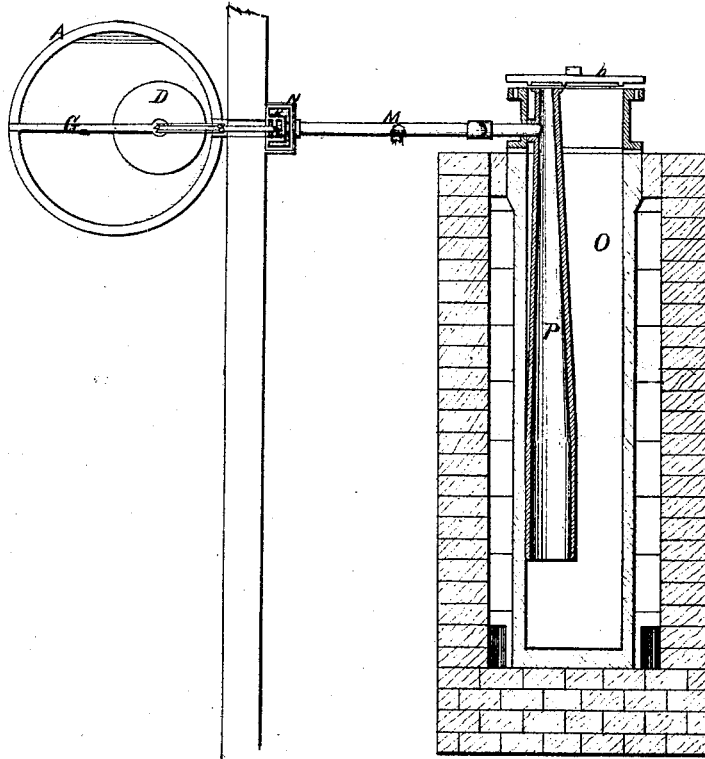
J. R. Smedberg,

2. Sheets, Sheet 2

Manif. Hydrocarbon Gas.

No. 109460.

Patented Nov. 22. 1870.



— PLAN —

— SHOWING RETORT BENCH AND PETROLEUM PIPE IN HORIZONTAL SECTION. —

Witnesses

Geo. H. Strong,

G. Fitzgerald

Inventor.

James R. Smedberg

United States Patent Office.

JAMES R. SMEDBERG, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 109,460, dated November 22, 1870.

IMPROVEMENT IN GENERATING GAS FROM HYDROCARBONS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JAMES R. SMEDBERG, of the city and county of San Francisco, State of California, have invented certain Improvements in Generating Illuminating Gas from Hydrocarbon Oils; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

My invention relates to certain improvements in the method and the apparatus employed for producing illuminating gas from hydrocarbon oils, and more especially from crude petroleum.

The invention consists in the use of a peculiar self-regulating feed apparatus, by which the flow of the oil is rendered at all times uniform, it being taken from the surface: and also in a water-jacketed seal, employed to prevent the return of gas through the supply-pipe, and also to prevent the vaporization of oil in the pipe from the heat.

Referring to the accompanying drawing for a more complete explanation of my invention,

A is a tank containing petroleum, and made of a sufficient size to hold the quantity desired.

The bottom of this tank is provided with a stuffing-box, B, through which a hollow spindle, C, slides. This spindle is finished so as to move smoothly through the stuffing-box, and may have a suitable discharge-nozzle at the bottom.

At the top of the spindle C is a float, D, which rests upon the surface of the oil in the tank.

Just beneath the line of flotation, a small opening, *a*, is made, through the side of the spindle C; and this opening will always be kept at the same distance beneath the surface of the oil, by the rise and fall of the float.

A screw-plug, E, is fitted into the side of the spindle which projects above the float a short distance, and by turning this plug down, it will partially stop the feed-opening *a*, and thus regulate the quantity admitted to the pipe.

A graduated stem, F, passes through the cross-bar G, and serves both to indicate the quantity of oil used and to guide the spindle as the float moves up and down.

By the use of the float and the spindle, with the opening *a*, or by other obvious equivalent devices, I am also enabled to feed the oil at all times from the surface, and the water and other heavy impurities will thus be allowed to settle to the bottom, from which they can be drawn off at convenient times.

The lower end of the spindle enters a larger shield-pipe, H, within which it moves up and down without

touching, this outer tube serving to prevent the oil being blown about by the wind, or otherwise affected.

A sort of funnel, I, receives the oil from the pipe C and conveys it to the pipe J, which in turn delivers it to a chamber, K.

This chamber has a diaphragm or partition, L, extending nearly to the bottom of it, so that the oil must pass beneath the partition and rise to the level of the pipe M. This arrangement serves as a seal, to prevent any gas from returning from the retort through the pipes.

In order to prevent any possibility of the oil being vaporized in or beyond the vessel K, it is surrounded by an outer vessel, N, which is filled with water, and which is provided with a pipe, N', so that cool water can be supplied if the contents become heated.

The pipe M conveys the oil to the retort O, into which it is passed. The interior of the retort is formed, in the present case, like the ordinary coal-gas retorts, but may be made of any form which will give satisfactory results.

Within the retort a pipe, P, extends from one end to near the other end.

The front end is so arranged that it is closed tightly by the same cover, *b*, which stops the retort.

No change will be necessary in adapting the ordinary retorts to my arrangement, except additional circular ribs upon the interior face of the cover, to fit the end of this pipe.

The rear end of the pipe is left open.

R is the stand-pipe through which the gas flows after it is formed.

The retort is kept at a very high temperature, and the oil is vaporized as it enters the pipe P, so that by the time the vapor escapes from the rear end of the pipe into the body of the retort, it has acquired such a heat as to abstract very little directly from the retort, and this renders it possible to retain the retort at a high heat without much difficulty.

The gas manufactured in this manner is permanent, and does not condense or lose its brilliancy when exposed to great cold, its permanence being the result of prolonged contact with the interior surface of the retort during its passage to the stand-pipe.

Whenever it is necessary to stop the operation, the float D in the tank A may be elevated from the surface of the oil by a cord, *c*, and lever, *d*, or other suitable device.

A cock may also be arranged in the pipe M, near the retort.

By removing the cover of the retort, the interior of it and of the pipe P will be exposed, and the deposit of coke which will be found in the pipe can be removed by a serrated punch, followed by a rake.

A light coating of lamp-black or fine carbon will be deposited in the retort, and this can also be removed.

As destructive distillation commences near the rear end of the pipe P, the deposit of coke will be greater in that part of the pipe. I therefore make it tapering, the largest opening being in the rear. This also gives greater facility for cleaning.

The retort will have to be opened so rarely, and for such short times, that little heat will be lost from this cause, and the high temperature necessary can be easily maintained.

The apparatus is peculiarly adapted for use in "through" or double-ended retorts.

It is also possible, by the feeding arrangement, to supply a constant quantity of liquid until the containing-vessel or tank is entirely empty; and this is important.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

The combination of the float D and hollow spindle C, arranged to traverse vertically in the tank A so as to feed constantly from the surface of the tank, substantially as described.

2. The combination of the adjustable plug E and hollow traversing spindle C, constructed and arranged to operate as described for the purpose set forth.

3. The vessel K, with its diaphragm L, together with the outer vessel N, when arranged to operate substantially as herein described.

In witness that the above-described invention is claimed by me, I have hereunto set my hand and seal.

JAMES R. SMEDBERG. [L. S.]

Witnesses:

GEO. H. STRONG,

GERALD FITZGERALD.