UNITED STATES PATENT OFFICE.

JAMES M. LEIGHTON, OF ROCHESTER, NEW YORK, ASSIGNOR TO HIMSELF, JOHN T. SALTER, GEORGE W. DYER, AND THOS. S. SPRAGUE.

IMPROVEMENT IN PROCESSES FOR MAKING ILLUMINATING-GAS.

Specification forming part of Letters Patent No. **191,980**, dated June 12, 1877; application filed March 14, 1877.

To all whom it may concern:

Be it known that I, JAMES M. LEIGHTON, of Rochester, in the county of Monroe and State of New York, have invented an Improvement in the Manufacture of Illuminating-Gas, of which the following is a specification:

This invention consists in an improvement on the processes for making illuminating-gas as patented to Frederick H. Eichbaum, April 4, 1876, reissue No. 7,024.

In processes for making illuminating-gas from petroleum or its products, or from wood or coal enriched with petroleum or its products, it is found by experience that in generating gas from such hydrocarbons a portion of these hydrocarbons is not thoroughly converted into a permanent and fixed gas, but is deposited upon the inner surfaces of the retorts as fixed carbon, or in the stand-pipes, filling them so that the gas cannot pass through them to the hydraulic main. The object, therefore, of this invention is to prevent this deposit and convert all the hydrocarbons into a fixed and permanent gas.

In the Eichbaum patent above referred to the hydrocarbons are injected into the retorts, by atmospheric pressure artificially created, through a pipe or pipes projecting into the retorts, and surrounded by heated gases, by means of which the hydrocarbons are vaporized to a considerable extent before they leave the injection-pipe. The vapor being discharged into the retorts is there very nearly, but not wholly, converted into a permanent gas, the unconverted portion being deposited as hereinbefore described.

Instead of injecting the oil through an unobstructed pipe, the pipe should be enlarged near its point to form a compression-chamber, and then be contracted at its discharge end so as to have a small orifice, and be inclosed within a larger pipe or shell. A suitable steam-pipe should be tapped into this larger pipe or shell, so that steam or superheated steam may be introduced into such larger pipe or shell, behind the discharge end of the oil-pipe, and serve as an injector to force the oil out of the end of the larger pipe or shell in the form of a fine vapor, which will readily be taken up and carried along by the volume of wood gas flowing in the same direction, and in its passage through the retorts the several gases become a single homogeneous fixed illuminating-gas of the required candle-power.

It will be understood that the volume of wood gas referred to in the preceding sentence flows in behind the sprayed hydrocarbons, and takes them up and sweeps them out of the retort, combining with them during such movement.

In this way I avoid the danger of the falling of a portion of the oil (particularly when the heat under the retort has been lessened) upon the inner surfaces of the retort, and of there becoming converted into hard carbon instead of into illuminating-gas, and in this way I am enabled to make illuminating-gas of the desired candle-power with a smaller quantity of oil.

In accomplishing this process I employ retorts such as are usually employed in coal-gas works, and inject the hydrocarbon, in the manner described by said Eichbaum, under atmospheric pressure artificially produced, and employ any of the known injectors with steam or superheated steam, as I have already described.

This steam may be first generated in any ordinary boiler, and I preferably superheat it in pipes introduced into the furnace of either the boiler or that under the retorts; or, in some instances, the steam may be created in the pipes themselves.

I therefore do not claim any portion of the process as described by said Eichbaum; neither do I claim any particular form of retorts or other mechanism or material in the manufacture of illuminating-gas; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

The process, in making illuminating-gas from wood and fluid hydrocarbons, of injecting such hydrocarbons, under air or gravity pressure, through a pipe into a retort, and spraying such hydrocarbons as they leave the pipe by a jet of steam introduced into such pipe in the same line of direction with a volume of wood gas flowing in behind such sprayed hydrocarbons, so that such wood gas shall take up such sprayed hydrocarbons and sweep them out of the retort, substantially as described.

JAMES M. LEIGHTON.

Witnesses:
D. H. BURTIS,
H. S. WHITE, Jr.