J. SHACKLETON.

Process for Manufacturing Illuminating Gas.

No. 208,641. Patented Oct. 1, 1878.

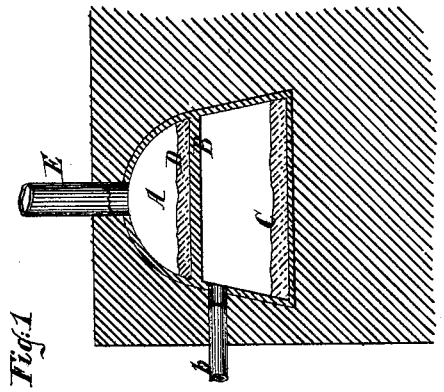

Fig. 1.

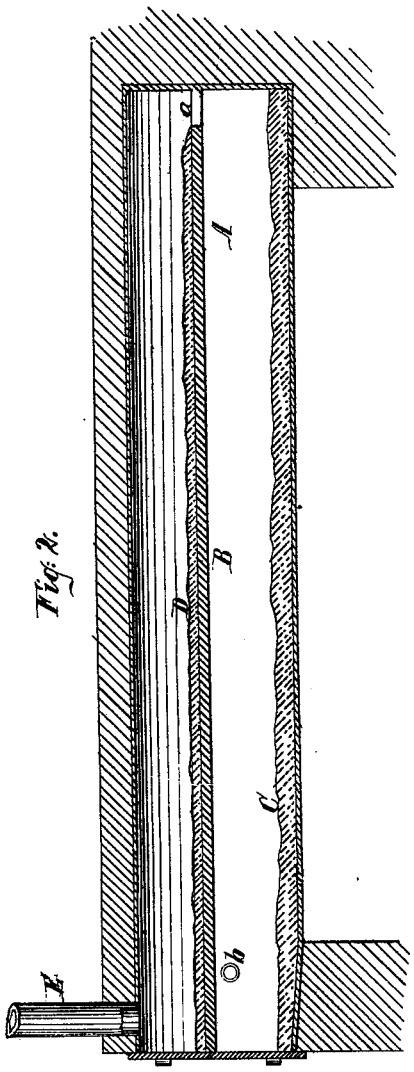

Fig. 2.

Witnesses:
Hugo Bruggemann
Otto Hupeland.

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by
Van Santvoord & Hauff
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UNITED STATES PATENT OFFICE.

JOSEPH SHACKLETON, OF RAHWAY, NEW JERSEY.

IMPROVEMENT IN PROCESSES FOR MANUFACTURING ILLUMINATING-GAS.

Specification forming part of Letters Patent No. **208,641**, dated October 1, 1878; application filed May 3, 1878.

To all whom it may concern:

Be it known that I, JOSEPH SHACKLETON, of Rahway, State of New Jersey, have invented a new and useful Improvement in the Manufacture of Illuminating-Gas, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a transverse section of the apparatus which may be used in carrying out my invention. Fig. 2 is a longitudinal section of the same.

Similar letters indicate corresponding parts.

My invention relates to a new process for the manufacture of illuminating-gas by passing a mixture of steam and hydrocarbon vapors over and in contact with a highly-heated layer of bituminous slack mixed with sawdust, and then conducting the mixture of gases obtained by such operation over a red-hot layer of fine anthracite coal, so that a permanent gas of good illuminating power can be produced in a very economical manner.

In carrying out my invention, I use, by preference, a retort, A, which contains a horizontal partition, B, extending throughout its entire length, and provided at its rear end with an aperture, *a*. Near the front end of the retort, and below the partition B, is a pipe, *b*, through which I introduce a mixture of steam and hydrocarbon vapors. The retort A is placed into a furnace, so that it can be readily heated to the required temperature, and on its bottom is spread a layer, C, of bituminous slack mixed with sawdust, while on the partition B is placed a layer, D, of fine anthracite coal. When the retort has been heated the pipe *b* is opened, and the gases evolved from the layer C of bituminous slack and sawdust are mixed with the steam and hydrocarbon vapors flowing in through the pipe *b*. The mixture of gases thus produced escapes through the aperture *a* in the rear end of the partition B, and in order to reach the stand-pipe E said gases have to pass over the red-hot layer, D, of anthracite coal. In passing over this layer the steam which has become superheated in its passage through the lower section of the retort is decomposed into hydrogen gas and carbonic oxide, and the hydrocarbon vapors mixed with the gases evolved from the bituminous slack and sawdust are converted into a fixed gas, which, together with the gases resulting from the decomposition of the steam, produces a large volume of gas of good illuminating power.

The principal advantage of my process is, that it enables me to employ bituminous slack, which heretofore could not be used in the manufacture of illuminating-gas, and in the apparatus which I have put up for carrying out my process I have been able to produce illuminating-gas at an expense of twenty-five cents for one thousand cubic feet.

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

The within-described process for producing illuminating-gas by passing a mixture of steam and hydrocarbon vapors over and in contact with a highly-heated layer of bituminous slack mixed with sawdust, and then conducting the mixture of gases obtained by such operation over a red-hot layer of fine anthracite coal, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 29th day of April, 1878.

JOSEPH SHACKLETON.

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.