

# UNITED STATES PATENT OFFICE.

WATSON KARR, OF FROSTBURG, MARYLAND.

IMPROVEMENT IN PROCESSES OF PREVENTING THE ACCUMULATION OF CARBON IN RETORTS.

Specification forming part of Letters Patent No. **187,866**, dated February 27, 1877; application filed January 29, 1877.

*To all whom it may concern :*

Be it known that I, WATSON KARR, of Frostburg, in the county of Alleghany and State of Maryland, have invented a new and improved process for preventing the accumulation of carbon in retorts used for the distillation of coal for the production of carbureted hydrogen or ordinary coal-gas; and I do hereby declare that the following is a full, clear, and exact description of the same.

In carrying out my invention I take of semi-bituminous and bituminous coals, in the proportion, by weight, of about one of the former to fifteen of the latter, respectively. I have found that class of semi-bituminous coal known as Cumberland or George's Creek well suited for the purpose.

The retort being at a working heat, I deposit the semi-bituminous coal first in the back end of the same; then complete the charge with the bituminous coal.

It is to be understood, as the rule, that the operation of thus combining the coals is to be continuous—that is to say, both kinds of coal will ordinarily be used in each charge. But if the deposit of carbon from a particular charge is very slight, or scarcely appreciable, the quantity of semi-bituminous coal used in the succeeding charge may be diminished.

The appearance of the retort when the charge is withdrawn is a certain test, indicating, by the presence or absence of carbon formations, a mean proportion of the coals to

be used by a slight increase or decrease of the semi-bituminous class.

The principle or rationale of my process is this: Semi-bituminous coal produces, mainly, hydrogen gas, which, in passing from the rear to the front end of the retort, combines with the carbon, which would otherwise be deposited on the inner surface of the retort by the heavier gas distilled from the bituminous coal, thus producing carbureted hydrogen. The process economizes fuel, since the retort, being always free from carbon, has only its own thickness intervening between the fire of the furnace and the coal to be carbonized. It lessens the time required for eliminating the gas contained in a given amount of coal, as compared with the time required when the surface of the retort is covered with carbon formations,) since the radiating-surface of retort is at its maximum when free from carbon. Lastly, the removal of carbon being destructive of the retort, as well as expensive, my process, by preventing its accumulation, increases the durability of the retort.

What I claim is—

The process of preventing the accumulation of carbon in retorts used for the generation of carbureted hydrogen, by combining bituminous and semi-bituminous coals, substantially in the manner described.

Witnesses: WATSON KARR.

A. W. HART,  
A. M. TANNER.