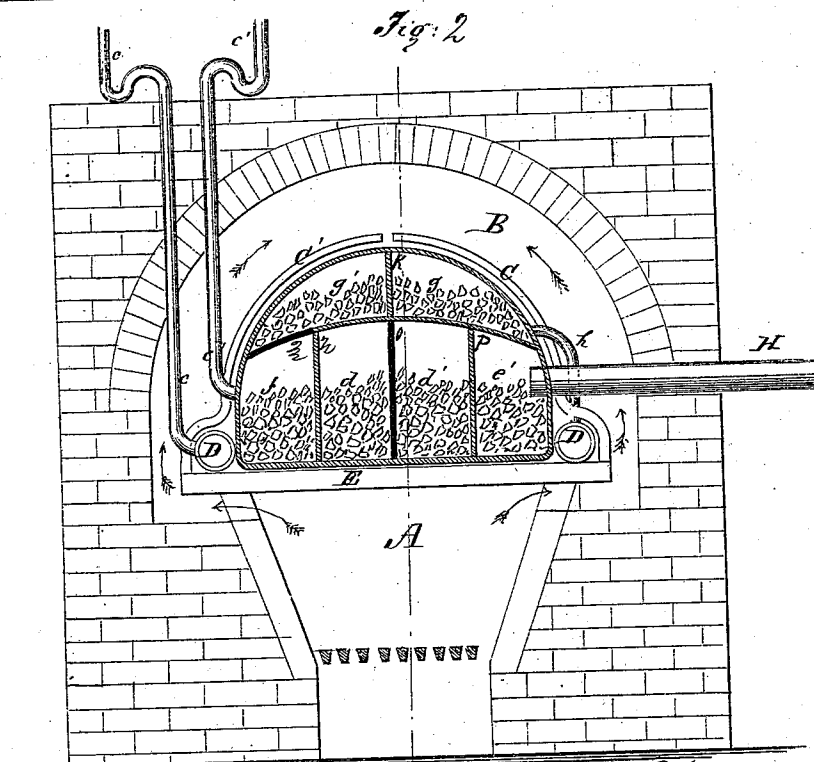
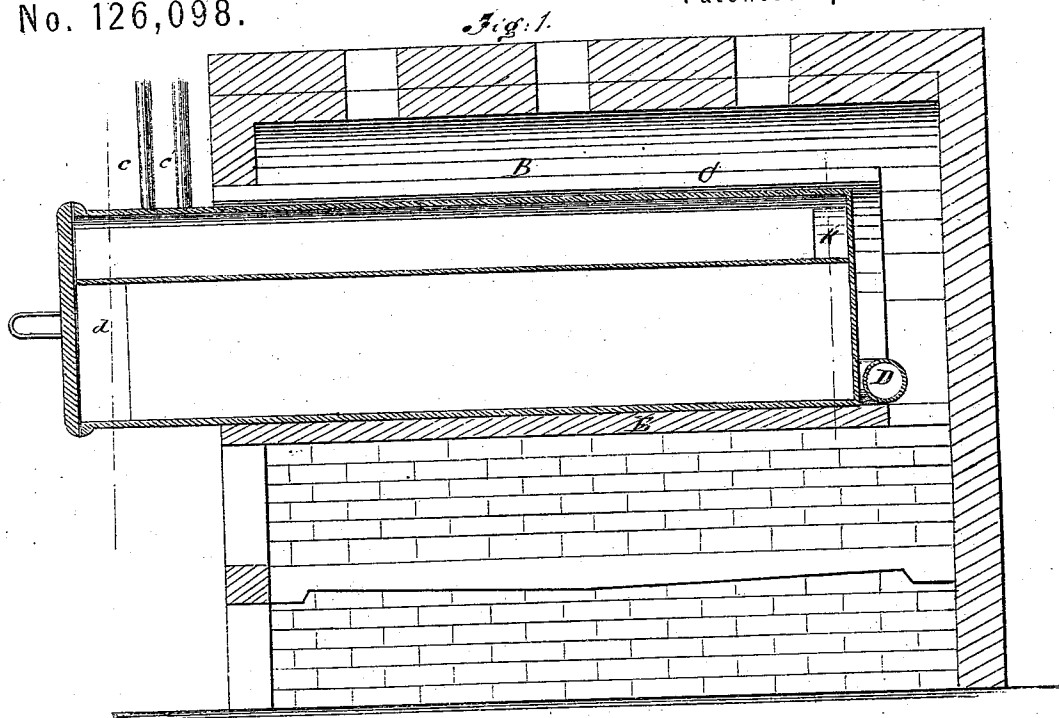
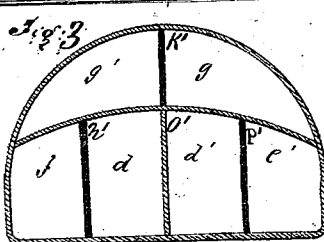


B. SLOPER & R. M. POTTER.  
 Improvement in Retorts for Manufacture of Gas from Hydrocarbons.  
 No. 126,098. Patented April 23, 1872.



Witnesses:  
*Chas. Nida*  
*Amos M. Chambers*



Inventor:  
*Byron Sloper*  
*Robert M. Potter*

# UNITED STATES PATENT OFFICE.

BYRON SLOPER, OF NEW YORK, N. Y., AND ROBERT M. POTTER, OF JERSEY CITY, NEW JERSEY.

## IMPROVEMENT IN RETORTS FOR THE MANUFACTURE OF GAS FROM HYDROCARBONS.

Specification forming part of Letters Patent No. 126,098, dated April 23, 1872.

### *Improvement in the Manufacture of Illuminating-Gas.*

#### SPECIFICATION.

#### *To all whom it may concern:*

Be it known that we, BYRON SLOPER, of New York city, New York, and ROBERT M. POTTER, of Jersey City, New Jersey, have invented a new and useful Improvement in Retorts for the Manufacture of Illuminating-Gas; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing.

Our invention relates to the manufacture of illuminating-gas by the process of combining the mixed gases generated by the decomposition of water or steam with the vapor of hydrocarbon liquid while it is being decomposed, for the purpose of converting the carbonic acid contained in the mixed water-gases into carbonic oxide, by the agency of the fuliginous matter contained in the hydrocarbon vapor during decomposition, as secured to us by Letters Patent dated January 23, 1872. The first part of our present invention relates to a compound retort of six chambers, so constructed that the upper part of the retort, which is the hottest part of the retort, is divided into two chambers, in which the steam is decomposed, and the lower part of retort, which is always at a lower heat, is divided into four chambers, the object being to devote more space in the retort for the decomposition of the oil than we do for the decomposition of the steam, as we have found by experience that the decomposition of the water-vapor is much more rapid than the formation of the oil-gas, and consequently requires less decomposing-surface; and by this arrangement of the retort we are enabled to devote more space for decomposing the oil-gas, and thus manufacture the gas much more rapidly. The second part of our present invention relates to the combination, with the steam-pipe and retort for the manufacture of water and oil-gases, of a tile or tiles, so molded and constructed that they will closely fit over the steam-pipe and retort, the object being to shield and protect the said pipe and retort

from the destructive action of the flames in the furnace, and preserve a more even degree of heat in the retort and steam-pipe.

In the accompanying drawing, Figure 1 is a vertical longitudinal section of our apparatus. Fig. 2 is a front-end view of our apparatus with the furnace-front and retort-head removed. Fig. 3 is a rear-end view of the compound retort with the cap removed.

A and B is the furnace. C C is a fire-tile, molded in sections, fitting and covering closely the compound retort and steam-pipe, and admitting of the expansion and contraction of the iron retort underneath it by the opening on its top. D D D represents the steam-pipe in the furnace, and surrounding both sides and the back end of the retort. *g* and *g'* are the decomposing steam-chambers in the retort, divided by the longitudinal partitions *k*, and filled with coke or other carbonaceous material to decompose the steam. *f d* and *d'* and *e'* are the four decomposing-chambers for the oil, which are also filled with coke or broken brick. These four chambers are divided by the three longitudinal partitions *n*, *o*, and *p*. E is the tile upon which the retort rests. H is the stand-pipe for the exit of the gas. *h* is the induction-pipe for conveying the superheated steam from the steam-pipe D into the decomposing-chamber *g*. *c* is a siphon-pipe for conveying the water into steam-pipe D, where it is immediately converted into steam, which passes round to the other end of said pipe, becoming superheated on its way, and finally enters the chamber *g* through the induction-pipe *h*. *c'* is a siphon-pipe for conveying the oil into the chamber *f*, where it is vaporized. The superheated steam enters chamber *g* at its front end; thence passes back to the rear end thereof, and through an opening, *k'*, into the chamber *g'*; thence forward to the front end thereof, becoming completely decomposed on its way. These gases then pass down into the oil-vaporizing chamber *f*, through an opening, *m*, and then come in contact with the vaporizing and decomposing oil. The water-gases and vapor from the oil here combine; then pass back to the rear end of chamber *f*, and through an opening, *n*, into the chamber

*d*; thence forward to the front end thereof, and through an opening, *o*, into the chamber *d'*, and pass back to the rear end thereof through an opening, *p'*, into the chamber *e'*; thence forward to the front end thereof, becoming converted in its course backward and forward through the retort into a brilliant, fixed, and permanent gas, which passes out through the stand-pipe *H*.

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

1. A compound retort, constructed and arranged substantially as described.

2. In combination with the steam-pipe and retort for the manufacture of illuminating-gas, a tile or tiles, molded, constructed, and used as a shield to protect the iron retort and steam-pipe from the destructive action of the flames of the furnace, substantially as above described.

BYRON SLOPER.  
ROBERT M. POTTER.

Witnesses:

SAMUEL M. CHAMBERS,  
MICHAEL MOTON.