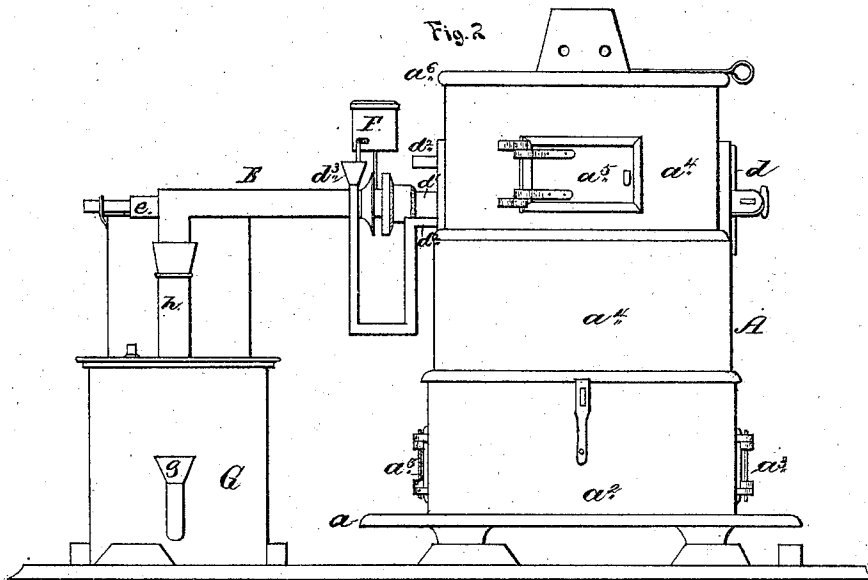
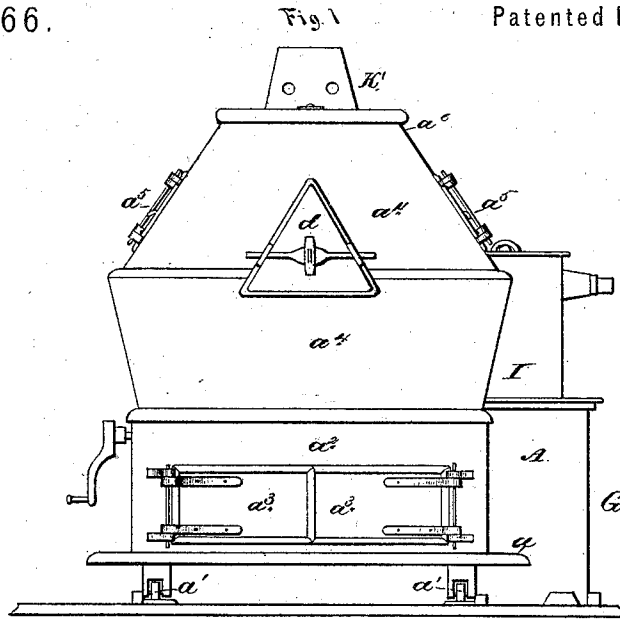


J. RIGBY.

Apparatus for the Manufacture of Gas from Hydro-carbon.

No. 135,666.

Patented Feb. 11, 1873.



Witnesses.

*R. M. Heek*  
*H. Carley Black*

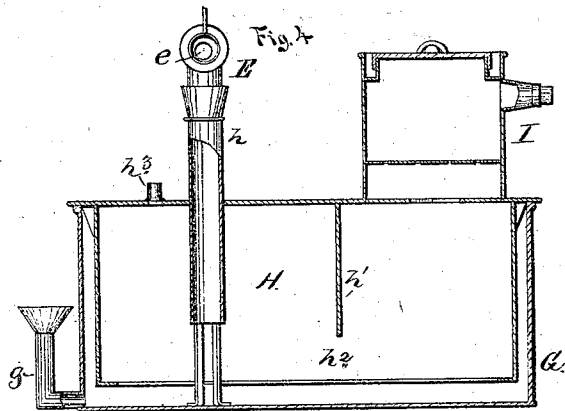
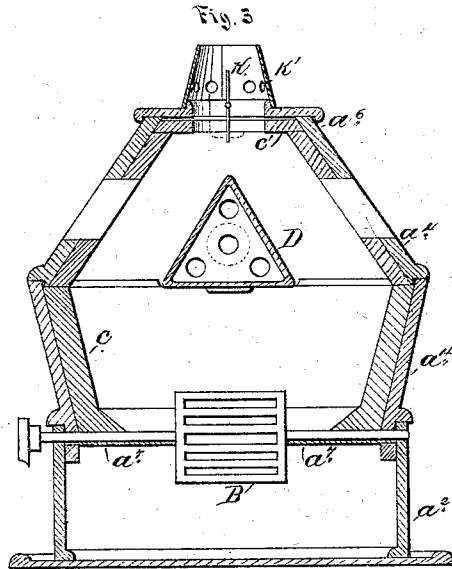
Inventor.

*James Rigby* by  
*Dyer, Beadle & Co.*  
*attys.*

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Witnesses.

*R. H. Steele*  
*Charles C. Clark*

Inventor.

*James Rigby by*  
*Dyer, Beadell & Co.*  
*attys.*

# UNITED STATES PATENT OFFICE.

JAMES RIGBY, OF PORTSMOUTH, OHIO.

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

Specification forming part of Letters Patent No. 135,666, dated February 11, 1873.

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

Be it known that I, JAMES RIGBY, of Portsmouth, in the county of Scioto and State of Ohio, have invented a new and useful Improvement in Gas-Retort; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

This invention consists of a simple, economical, and effective apparatus for making gas of fine quality with perfect safety. The details of construction will be fully described hereinafter.

In the drawing, Figures 1 and 2 are views, in elevation, of my improved apparatus; and Figs. 3 and 4 are views, in sections, of various parts.

To enable others skilled in the art to make and use my invention, I will now proceed to describe fully its construction and operation.

A represents the furnace, which may be constructed in any proper manner and of any suitable material. It preferably consists, however, of a base, *a*, supported upon proper wheels *a*<sup>1</sup> *a*<sup>1</sup>, as shown, ash-pit *a*<sup>2</sup> having air-tight doors *a*<sup>3</sup> *a*<sup>3</sup>, and upper and lower sections *a*<sup>4</sup> *a*<sup>4</sup>, the latter of which is provided also with air-tight doors *a*<sup>5</sup> *a*<sup>5</sup>. The upper section is provided with a cover, *a*<sup>6</sup>, which supports the base of the smoke-pipe, as shown. The ash-pit is separated from the combustion-chamber by the removable castings *a*<sup>7</sup> *a*<sup>7</sup>, Fig. 3, supported by any suitable means, which castings are so constructed as to leave a recess for the grate B. The combustion-chamber, which consists of the upper and lower sections, is lined with tiles or bricks peculiarly constructed for the purpose, so that they may be readily inserted in place and be held without cement or other fastening. The tiles *c* in the lower section correspond in their general form with the outline of the section, their lower edges being provided with inclined pieces, as shown, for the purpose of contracting the lower portion of the chamber. The tiles in the upper section correspond with the outline of the upper section, and are provided with openings for the retort D and doors *a*<sup>5</sup>. These tiles are bound together at their upper edges by means of a cap, *c*<sup>1</sup>, provided with projections which rest in suitable sockets, as shown

in dotted lines in Fig. 3. This cap is further provided with a central opening for the escape of the products of combustion. The retort D is peculiarly constructed; its form is that of a triangular prism, all its sides of course being alike. It is provided at one end with a removable plate, *d*, which is secured in position in any suitable manner. At the opposite end it is provided with an opening having a pipe, *d*<sup>1</sup>, as shown, for carrying away the gas from the retort. It is further provided also with an orifice in each corner, in one or more of which may be inserted a pipe or pipes, *d*<sup>2</sup>, communicating with the receiving-funnel *d*<sup>3</sup>, as shown. The hole or holes not used for pipes must be stopped with suitable plugs. E represents the pipe which connects the retort with the pipe *h* of the chamber H for washing the gas. Upon the pipe is supported the bucket F for holding the paraffine, the discharge-cock of which is immediately over the receiving-funnel, as shown. The pipe E, it will be observed, is provided with an opening, *e*, upon the vertical portion of its elbow, which opening is in line with its horizontal portion and also with the retort.

By means of this construction the pipe and also the retort may be cleaned without breaking the joint which connects the two together. When it is necessary, however, to break the joint, the furnace may be easily moved back upon its wheels.

G represents the trough for holding the water for washing the gas, which is provided with a funnel, *g*, for introducing the water, as shown. H represents the chamber in which the gas is washed. It is provided with the supply-pipe *h*, partition *h*<sup>1</sup>, and opening *h*<sup>2</sup>, through which latter the gas is discharged into the paraffine. It is also provided with a pipe, *h*<sup>3</sup>, through which water may be introduced, if desired. This chamber is held in place by means of an overhanging flange which rests upon the edge of the trough G. I represents the purifying-chamber, which rests upon chamber H, as shown. It is provided with a perforated bottom and with a discharge-pipe, through which the gas, when purified, is conveyed to the gasometer. It is provided about its upper edge with a trough for holding water, in which the edge of the cover rests, as shown. The top of the furnace is provided with means for con-

suming the smoke. K represents a damper, the circumference of which is a little smaller than the circumference of the opening in which it is placed, and which has, moreover, a central orifice. The chimney-base K', which incloses the opening through the cover, is provided with orifices for the entrance of air, as shown. The result of this construction is to divide the products of combustion, the smoke being compelled to pass outside the damper, while the flame and heat pass through its central opening. The entrance of the air at this point exposes the smoke, as it were, to a blast, by means of which it is consumed.

The operation of my improved apparatus is as follows: Paraffine or other suitable substance is placed in the bucket F and is permitted to flow in proper quantities into the pipe  $d^2$ , and from thence into the retort. The arrangement of the pipe is such as to enable the paraffine to enter against the pressure in the retort. A fire having been kindled in the furnace, gas is generated in the retort and conveyed through the connecting-pipes to the washing-chamber, where it is compelled to pass through the water under partition  $h^1$ , and from thence into the purifying-chamber, which latter, being filled with corn-cobs, shavings, or other similar material, removes from it any tarry substance or other residuum which may not have been removed by the water. From the purifying-chamber the gas passes into the gasometer, from which it may be drawn as needed. The construction of the furnace is such that little fuel is required to obtain the required heat. The doors for introducing the fuel are located above the surface which is exposed to the fire, so that the latter is never cooled by opening the doors.

From the peculiar construction of the retort it is adapted to be used with either of its sides exposed to the fire, so that when one side is nearly burned out a fresh side may be substi-

tuted for it. By this means the retort is made to last three times as long as one constructed in the ordinary manner. By means of this apparatus gas of fine quality may be quickly and economically produced without the slightest danger of explosion.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A retort constructed with equal sides and adapted to present either side to the action of the flames, as described.
2. The retort D having the centrally-located pipe  $d^1$  and openings in each angle from the pipe  $d^2$ , as described.
3. The combination of the furnace A, constructed as described, with the changeable retort D, as described.
4. The combination of the opening in the top, the furnace, the damper, and the chimney-base, as described, for the purpose of consuming smoke.
5. The combination of the furnace, made movable by wheels, as described, with the stationary washing-chamber, as and for the purpose set forth.
6. The combination of the retort D with the pipe E having the opening  $e$ , the pipe and retort being located on the same horizontal plane, as described.
7. The purifier, constructed and arranged as described.
8. The combination of the furnace, the retort, the supply-pipe, the connecting-pipes, the washing-chamber, and the paraffine, as described.

This specification signed and witnessed this 20th day of March, 1872.

JAMES RIGBY.

Witnesses:

S. J. NOYES,  
E. GREENAWAY.