

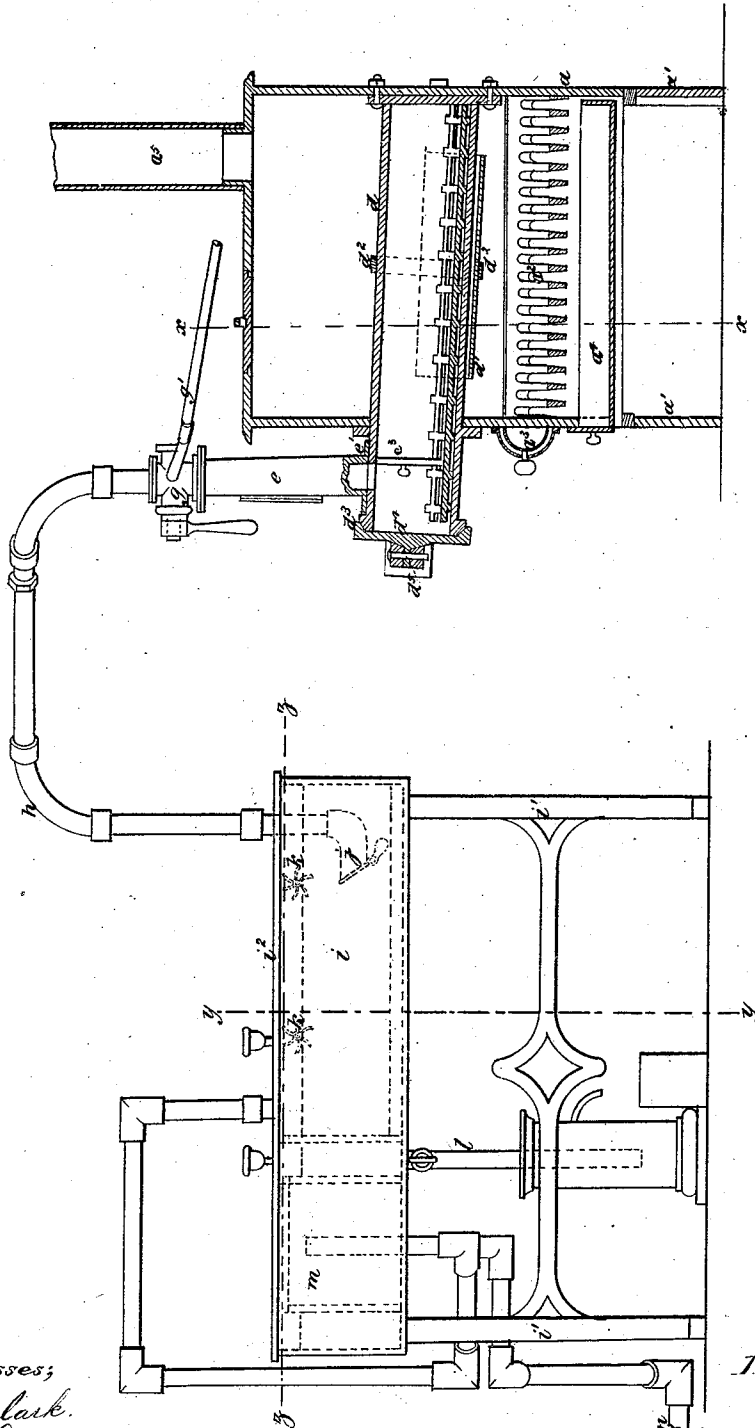
W. VINCENT.

Apparatus for the Manufacture of Illuminating Gas.

No. 153,184.

Patented July 21, 1874.

FIG. 1.



Witnesses;
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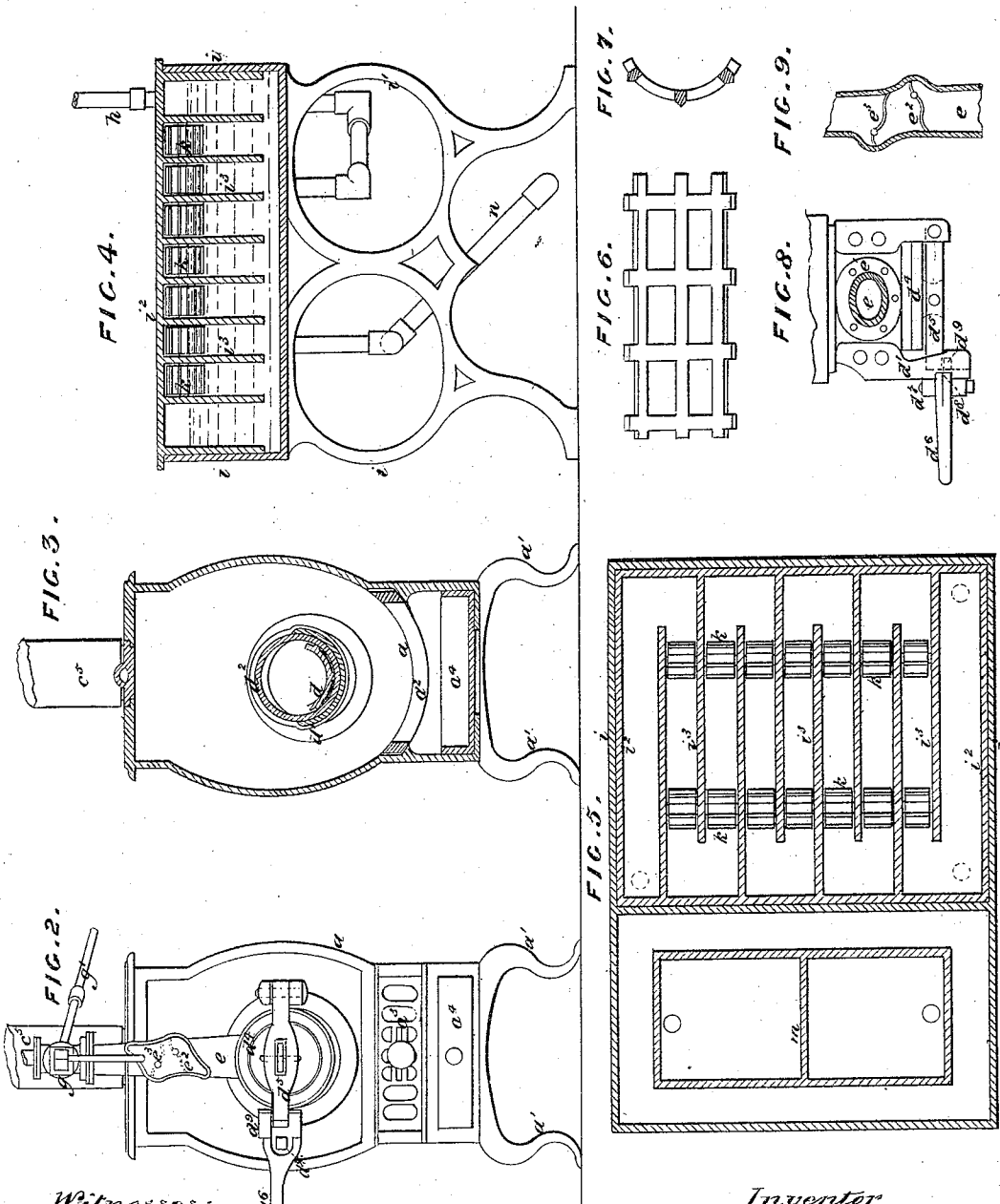
Inventor.
William Vincent.
By Dyer, Beadle & Co.
Attys.

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UNITED STATES PATENT OFFICE.

WILLIAM VINCENT, OF ARBORFIELD, ENGLAND.

IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE OF ILLUMINATING-GAS.

Specification forming part of Letters Patent No. **153,184**, dated July 21, 1874; application filed November 17, 1873.

To all whom it may concern :

Be it known that I, WILLIAM VINCENT, of Arborfield, Berkshire, England, machinist, have invented Improvements in Apparatus for Manufacturing Gas, of which the following is a specification :

My invention relates to improved apparatus for manufacturing gas, and which may not only be used in gas-works but may be placed without inconvenience or danger in houses, shops, warehouses, and other inhabited or occupied buildings wherein gas for illuminating or heating purposes is required.

In practicing the said invention, I use a retort, preferably made cylindrical, and placed over or within a furnace, which may be either portable or stationary. The said retort is provided on the under side with an external shield to prevent its destruction by the heat. I make the mouth of the retort conical, and provide the same with a cover, which is fitted to the mouth, so that it closes the same without luting. Inside the retort I place a removable grating constructed of cross-bars, shaped to lie in the bottom of the retort, and which allows the tar to flow freely along the bottom of the retort away from the charge. The ascension-pipe of the said retort is made tapering, its lower end being considerably larger in diameter than its upper end. This formation of the said pipe prevents its corrosion and its filling up with the tar and other substances from the retort. The said ascension-pipe is secured to the upper side of the front of the retort, between the mouth thereof and the front of the furnace, and is preferably made oval in transverse section, to permit its having a large area without making it necessary for the retort to project a great distance from the furnace. This furnace is made with a casing of fire-clay, cast-iron, or other suitable material, and is provided with a grate, whose bars are curved transversely to conform to the shape of the under side of the retort. The said furnace is, preferably, mounted on legs, and may be easily moved. At the top it has a chimney, and an aperture through which the fuel is introduced, the said aperture being provided with a suitable cover. The front of the furnace is also provided with a small door for stoking and regulating the supply of air to the

fire. The condenser or washer is a cast-iron box, which may also be mounted on legs or standards. The top or cover of the said box is formed with a number of division-plates. When this condenser or washer is in use these plates project down nearly to the bottom of the box, which is partially filled with water. The said plates are so arranged that the space above the water-line forms an indirect or winding passage from end to end of the washer. The gas-inlet pipe extends down into the water, and is provided at its mouth with a balanced self-closing valve, which prevents any return of gas from the washer. Between the aforesaid division-plates I arrange agitating-wheels, the same being mounted upon a bolt or spindle, which extends through the box.

I prefer to provide the condenser or washer with a tar-pipe and with a safety-pipe sealed by the water in the box. I also prefer to use a purifier made in one piece with the washer. It may be arranged at the side, end, or bottom of the same. The said purifier contains lime, sawdust, or other suitable substances.

Figure 1 shows my improved apparatus, partly in elevation and partly in section. Fig. 2 is a front elevation of the aforesaid furnace and retort and parts connected therewith. Fig. 3 is a vertical transverse section of the same on the line *x x*, Fig. 1. Fig. 4 is a vertical transverse section of the condenser and parts connected with the same on the line *y y*, Fig. 1. Fig. 5 is a horizontal section of the same on the line *z z*, Fig. 1. Fig. 6 is a plan, and Fig. 7 a transverse section, of the aforesaid grating to be placed in the retort. Fig. 8 is a plan of the front end of the retort. Fig. 9 is a vertical section of the stand-pipe.

Like letters indicate the same parts throughout the drawing.

a is the furnace, which is mounted on the legs *a*¹, or is otherwise supported at a convenient height from the floor. *a*² is the furnace-grate, consisting of curved bars, as above described. *a*³ is the door for regulating the admission of air to the furnace. *a*⁴ is the ash-pan. *a*⁵ is the chimney. The retort *d* is placed in the said furnace in a slightly-inclined position, as shown. *d*³ is the conical mouth of the said retort. *d*¹ is the shield placed at its under side. The said shield is supported by the

band or hoop d^2 passed around the retort. The forward end of this shield is subjected to the greatest heat, and when it has been burned away the said shield is reversed, and when the same is completely destroyed it is readily removed and replaced by a new shield. The cover d^4 is jointed at its center to an adjustable bar, d^5 , which is hinged or pivoted to one side of the retort. At the opposite side the said retort has a fixed arm, d^6 , with a recess which receives the end of the said bar when the cover is closed. A lever, d^6 , with an inclined piece on its end, is arranged to turn on a fulcrum, d^7 . The said lever is formed with an eccentric, d^8 , which, when the end of the bar is in the recess, and the lever in the position shown in Fig. 2, covers the end of the said bar and locks it in the said recess, the inclined edge d^9 acting like a cam upon the said bar, and forcing the cover tightly down upon its seat. The end of the bar is preferably provided with a small anti-friction roller to work in contact with the surface d^9 . By turning the lever into a vertical position the cover is released.

The taper stand-pipe e , as shown in Fig. 1, is arranged as near as practicable to the front of the furnace-casing, and is secured to the top of the retort by bolts or screws passed through the flange e^1 , or by other suitable fastenings. g is a safety-cock at the top of the said stand-pipe. This safety-cock prevents explosions in opening the said retort, and renders the apparatus very safe and thoroughly under control. The said cock is provided with a small outlet-pipe, g' , for permitting the escape of the vapor and carbonic-acid gas from the retort when the same is first charged, and for preventing the passing of any impurities with the gas into the condenser. The said stand-pipe also has gratings, as shown in Fig. 2, for preventing the passage of the tar with the gas from the stand-pipe. The lower grating e^2 is preferably made coarse, and the upper grating e^3 very fine; or I may place these gratings in the mouth-piece, as shown at e^3 , Fig. 1. A pipe, h , extends from the safety-cock to the condenser, as clearly shown in Fig. 1. The body of the said condenser, as before stated, is a cast-iron box, i , mounted on standards i^1 , or other suit-

able supports. i^2 is the top or cover of the said box provided with the partition-plates i^3 , which project down nearly to the bottom of the box i . j is the balanced valve at the end of the inlet-pipe h immersed in the water, as shown. $k k$ are the agitating-wheels. l is the tar-pipe, which extends down into the tar-pot, as shown in Fig. 1. m is the purifier. n is the pipe for conducting the gas therefrom to the gas-holder. Another pipe conducts the gas from the said holder to the service-pipes, from which the same is supplied to the burners. The condenser may also be constructed without a purifier, as the latter will very seldom be required.

With my apparatus, as above described, I obviate the necessity of bolts and nuts or other expensive fastenings for the hydraulic main or condenser, and by the use of the said apparatus I can manufacture gas more economically than has heretofore been practicable.

The gas may be produced from any material suitable for the purpose. As it passes through the condenser from the inlet to the outlet aperture it turns the aforesaid wheels and causes them to agitate the water, and thereby effectually cleanses the gas, preventing the entrance of any tar into the purifier. From the latter or the condenser the gas passes to the gas-holder, whence it is taken and used in the ordinary manner.

I claim as my invention—

1. The retort described, having a conical end, d^3 , in combination with the cover d^4 having a correspondingly-inclined edge, and adapted to shut over the conical end, the lever d^5 , and the vertically-moving lever d^6 having the cam-face d^9 .

2. A retort provided with the gratings $e^2 e^3$ in the stand-pipe or grating e^3 in the mouth-piece of the retort, substantially as and for the purpose described.

WILLIAM VINCENT.

Witnesses:

HENRY I. NOONE,
GEORGE HASELTINE.

International Patent Office,
8 Southampton Buildings,
London, England.