

(No Model.)

2 Sheets—Sheet 1.

E. MERTZ.

HYDROCARBON GAS APPARATUS.

No. 262,455.

Patented Aug. 8, 1882.

Fig 3.

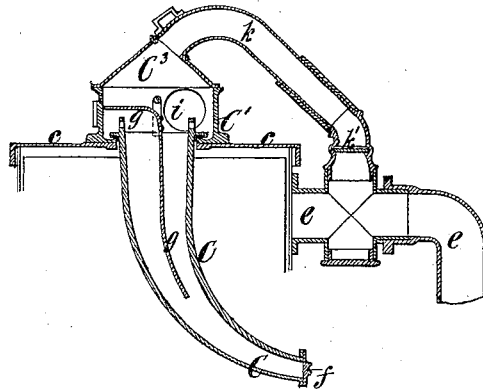


Fig 1.

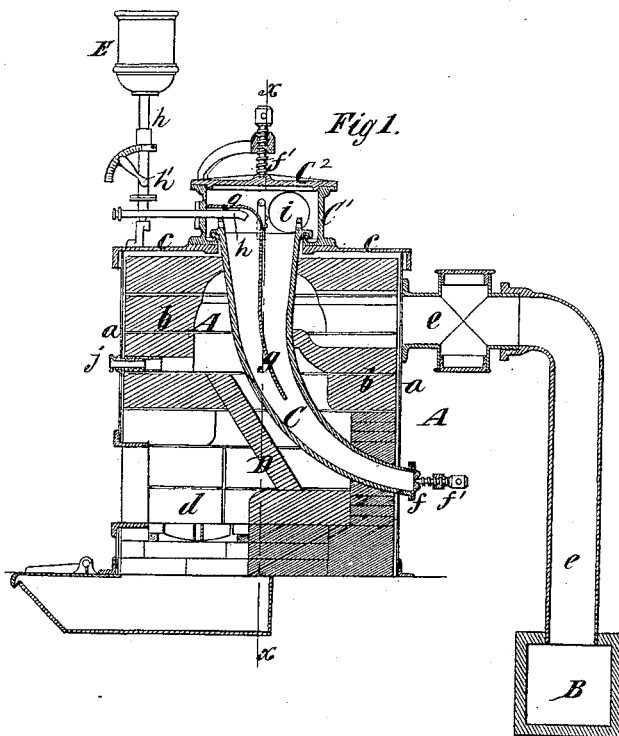
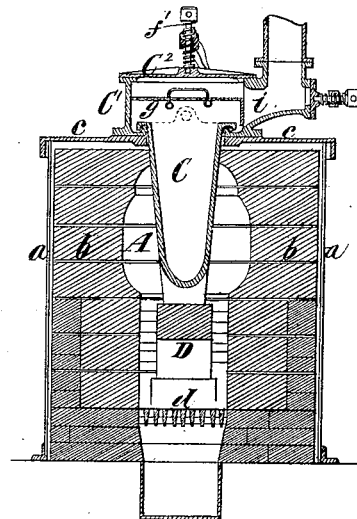


Fig 2.



Witnesses:
Fred Wagner
Ed. Moran

Inventor:
Emile Mertz
by his Attorneys
Brown & Wagoner

(No Model.)

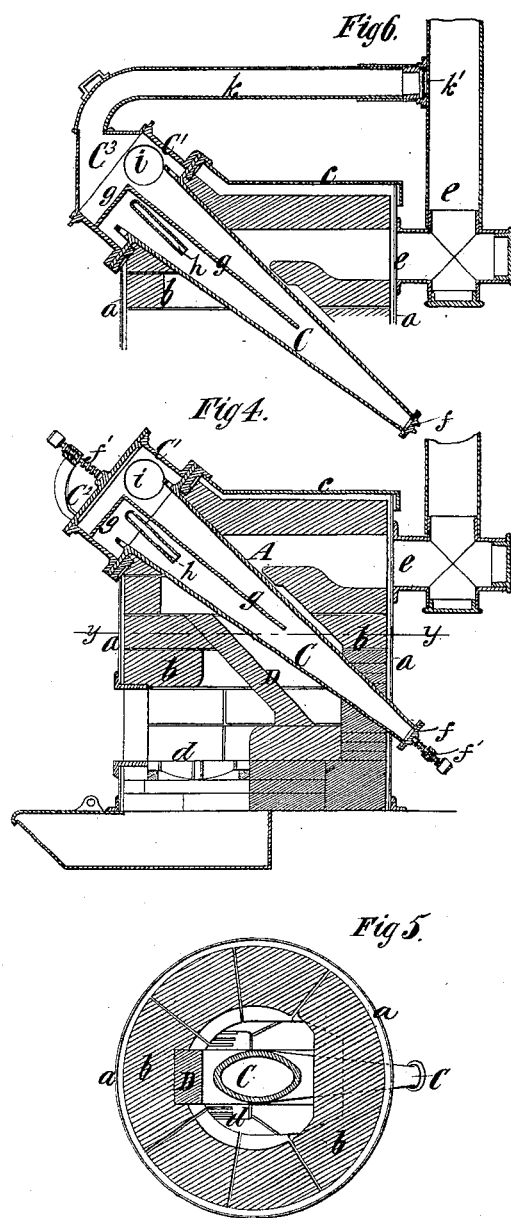
2 Sheets—Sheet 2.

E. MERTZ.

HYDROCARBON GAS APPARATUS.

No. 262,455.

Patented Aug. 8, 1882.



Witnesses:
Jno. Haynes
Edw. Moran

Inventor:
Emile Mertz
by his Attorney
Brown & Brown

UNITED STATES PATENT OFFICE.

EMILE MERTZ, OF BASLE, SWITZERLAND, ASSIGNOR OF ONE-HALF TO
BRUSTLEIN, SURY & CO., OF NEW YORK, N. Y.

HYDROCARBON-GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 262,455, dated August 8, 1882.

Application filed January 24, 1882. (No model.) Patented in France March 27, 1880, No. 135,808; in Spain January 20, 1881, No. 1,446; in England March 28, 1881, No. 1,368; in Belgium March 28, 1881, No. 54,202, and in Italy April 9, 1881, No. 12,834.

To all whom it may concern:

Be it known that I, EMILE MERTZ, of Basle, in the Republic of Switzerland, have invented certain new and useful Improvements in Hydrocarbon-Gas Apparatus, of which the following is a specification.

My invention relates to the retorts employed in the production of gas for lighting and heating purposes from heavy oils of petroleum and schist, or from oleaginous or fatty matters; and the objects of my invention are to provide for cleaning or burning out the retort after each operation to free it from deposits of residual matter; to provide for more evenly heating the retort, and to prevent any hydrocarbon vapor from escaping from the retort until converted into a fixed or permanent gas.

To these ends my invention consists in the combination, with a retort oven or furnace, of a retort set in an inclined position, made tapering from near its upper end downward, and having its ends projecting beyond the oven or furnace, and provided with removable covers at both ends and a pipe at the upper and larger end of said retort for introducing liquid hydrocarbon. The hydrocarbon, as it passes downward over the interior surface of the retort, is constantly reduced in quantity by evaporation, and as the retort tapers downward its interior surface decreases in about the same proportion as the hydrocarbon, and the liability of burning the hydrocarbon is greatly reduced.

The invention also consists in the combination, with a retort oven or furnace having a suitable smoke-flue, of a retort set in an inclined position and having both its ends projecting beyond the oven or furnace, and removable covers at the upper and lower ends of the retort, the smoke-flue of the furnace being provided with a hood and pipe, which may be applied to the upper end of the retort when the cover is removed for conducting away the smoke while burning out the retort.

The invention also consists in the combination, with an inclined retort tapering from near the upper end downward, of a removable dia-

phragm-plate extending longitudinally of the retort and extending at its upper end transversely to the side of the retort which is adjacent to the fire, and a pipe for introducing liquid hydrocarbons arranged below the transverse portion of said diaphragm, and on the same side of the longitudinal portion of said diaphragm.

In the accompanying drawings, Figure 1 represents a vertical section of a retort oven or furnace and a retort embodying my invention. Fig. 2 represents a similar section on the plane of the dotted line *x x*, Fig. 1. Fig. 3 represents a sectional view of the retort alone and a pipe connecting its head with the smoke-flue. Fig. 4 represents a vertical section, similar to Fig. 1, of a retort oven or furnace and a retort of modified form, also embodying my invention. Fig. 5 represents a horizontal section on the dotted line *y y*, Fig. 4; and Fig. 6 represents a vertical section, similar to Fig. 4, of the retort, the upper part of the oven or furnace, and a hood and pipe connecting the head of the retort with the smoke-flue.

Similar letters of reference designate corresponding parts in all the figures.

A designates the retort oven or furnace, which is of cylindric form, and may be advantageously composed of a cylindric casing, *a*, lined with fire-brick *b*, and a covering-plate or top plate, *c*. From the fire-place *d* of the oven or furnace the products of combustion pass upward and out through a pipe or passage, *e*, which conducts them to the smoke-flue B.

C designates the retort, which may be formed of the usual material, and which is surmounted by a head, *C'*, to which it is luted to form a tight joint. The upper end of the retort, where it enters the head, is vertical; but the retort gradually inclines from just below the head downward and outward in a curved direction, and its lower end projects through the side wall of the oven or furnace almost horizontally, as seen in Fig. 1. The retort C tapers from its upper end downward clear to the lower end, and at the upper end is a cover, *C''*, fitted and luted to the head C, while at the lower end is

a removable cover, *f*. Both the covers C^2 and *f* are retained in place by screws *f'* in a manner well understood.

In order to prevent the products of combustion from impinging directly against the under side of the inclined retort, and thereby unduly heating that portion of the retort, I place between the fire-place *d* and the adjacent wall of the retort *C* an inclined slab or guard-plate, *D*, of fire-clay or other suitable material. On each side of the said slab are passages amply sufficient in size for the passage of the products of combustion, and by the use of the said slab I provide for heating the retort more uniformly throughout.

In the retort *C* is a removable diaphragm, *g*, which extends transversely from the same side of the head as that on which the fire-place is located, partly across the head, and which, so far as the diaphragm is concerned, may be considered as a part of the retort, and thence extends downward longitudinally for a considerable distance. The upper portion of the diaphragm may be varied in form to suit the shape or construction of the head of the retort.

E designates a reservoir or supply-vessel for liquid hydrocarbon, which is connected by a pipe, *h*, with the retort below the transverse portion of the diaphragm *g* and on the same side of the longitudinal portion as that on which said transverse portion extends. The supply of hydrocarbon may be controlled by a cock or valve, *h'*, and adjacent to the said cock or valve is represented a scale or index for determining the amount of opening to be given to the said cock or valve.

From the head *C'* of the retort extends a pipe or passage, *i*, leading to the purifier or hydraulic main, and best shown in Fig. 2. When the hydrocarbon is introduced into the retort it falls upon the under side or lower wall thereof, which is red hot, and that portion which is vaporized tends to fly upward and escape. The diaphragm *g* prevents this, however, and in order to escape the vapor must pass down to and around the lower end of the diaphragm, and in traveling along the red hot wall of the retort the vapor is converted into a fixed or permanent gas before it can escape through the pipe *i*. When the operation of the retort is completed the covers C^2 and *f* are removed, and the air, entering the red hot retort, produces combustion, and the residual matters remaining therein are all consumed, thereby cleaning the retort.

The making of the retort with a downward taper is very advantageous, as the hydrocarbon which is introduced at the top is gradually reduced in volume by evaporation as it flows downward, and as the surface of the retort decreases in about the same proportion the surface will be well covered throughout with hydrocarbon, and there will be less liability of burning the hydrocarbon.

The making of the diaphragm-plate *g* removable is also very advantageous, because if

it were fixed the surface of the retort which is to the left of and below the plate *g* would not be properly burned out.

A peep-hole, *j*, is provided for ascertaining the condition of the retort and the fire.

I may here remark that when the retort is being burned out no smoke or gaseous products of combustion can escape through the pipe *i*, because they have not enough pressure to enter the hydraulic main.

In Fig. 3 the retort *C* is represented as having the covers C^2 and *f* removed, and as having a hood, C^3 , and conductor or smoke-pipe *k* applied to the head of the retort for connecting it with the smoke or escape flue or pipe *e*. The passage through the pipe is controlled by a valve, *k'*. After burning out the retort the hood C^3 is removed and the covers C^2 and *f* are replaced.

Referring, now, to Figs. 4, 5, and 6, the construction of the oven or furnace *A* is the same as that previously described, it being composed of a cylindric sheet-iron or other metal casing, a fire-brick lining *b*, a top or cap plate, *c*, and fire-place *d*, from which the products of combustion escape through a pipe, *e*, to the smoke-flue. (Not here shown.) The retort *C* tapers from its upper end downward, like the one previously described; but, instead of being inclined downward in a curved direction, it is straight and extends diagonally across the oven or furnace and projects at both ends beyond the same. The retort is provided with a head, *C'*, and at the lower end is a removable cover, *f*, held in place by a screw, *f'*. The cover C^2 in Fig. 4 is like that shown in Fig. 1; but in Fig. 6 the cover C^2 is removed and the hood C^3 is applied for burning out the retort. The arrangement and construction of the diaphragm *g* and the pipe *h* for supplying liquid hydrocarbon is the same as before described, and so, also, is the arrangement of the slab or guard-plate *D*.

By my invention I provide for more readily cleaning out retorts used in gas apparatus of the kind described. I increase the efficiency of such retorts.

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

1. The combination, with a retort oven or furnace, of a retort set in an inclined position, made tapering from near its upper end downward, and having its ends projecting beyond said oven or furnace, and provided with removable covers at both ends and a pipe at the upper and larger end of said retort for introducing liquid hydrocarbon, substantially as and for the purpose herein described.

2. The combination, with a retort oven or furnace having a suitable smoke-flue, of a retort set in an inclined position and having both its ends projecting beyond the oven or furnace, and removable covers at the upper and lower ends of the retort, the smoke-flue of the furnace being provided with a hood and pipe, which may be applied to the upper end

of the retort when the cover is removed, for conducting away the smoke while burning out the retort, substantially as described.

5 3. The combination, with the inclined retort C, tapering from near its upper end downward, of the removable diaphragm-plate *g* and the pipe *h* for supplying liquid hydrocarbon, arranged and operating substantially as herein described.

In testimony whereof I hereunto subscribe in my name this 29th day of October, 1881.

EMILE MERTZ.

Witnesses:

Z. MARIN,

T. WIRT.