(No Model.) 3 Sheets—Sheet 1.

R. H. SMITH.

GAS APPARATUS.

No. 260,712. Patented July 4, 1882.

Fig. 1

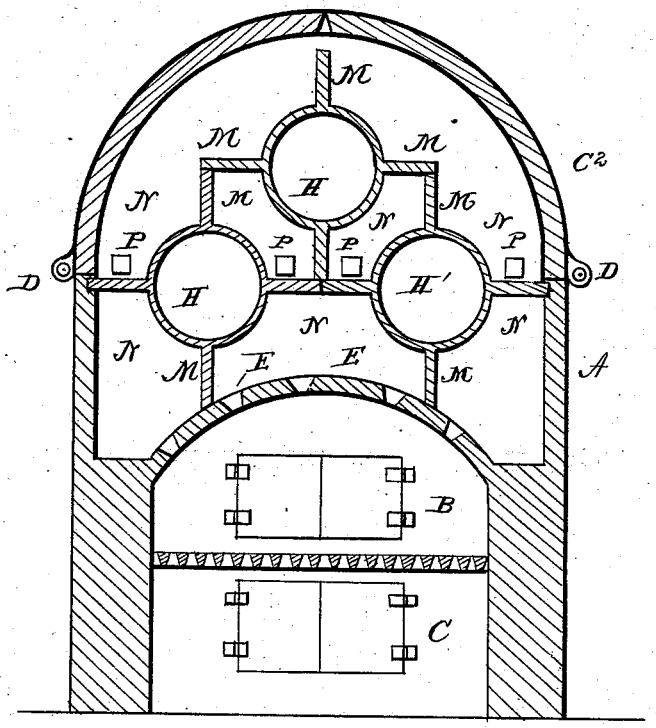


Fig. 3

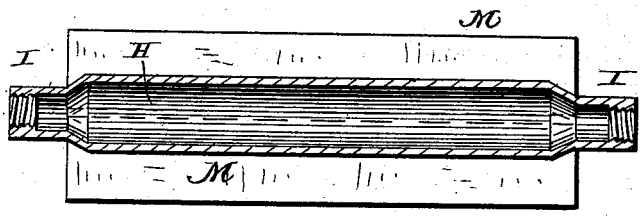
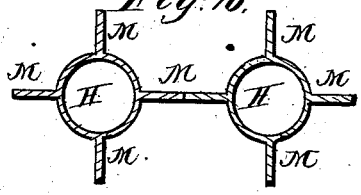


Fig. 10.



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(No Model.) 3 Sheets—Sheet 2.

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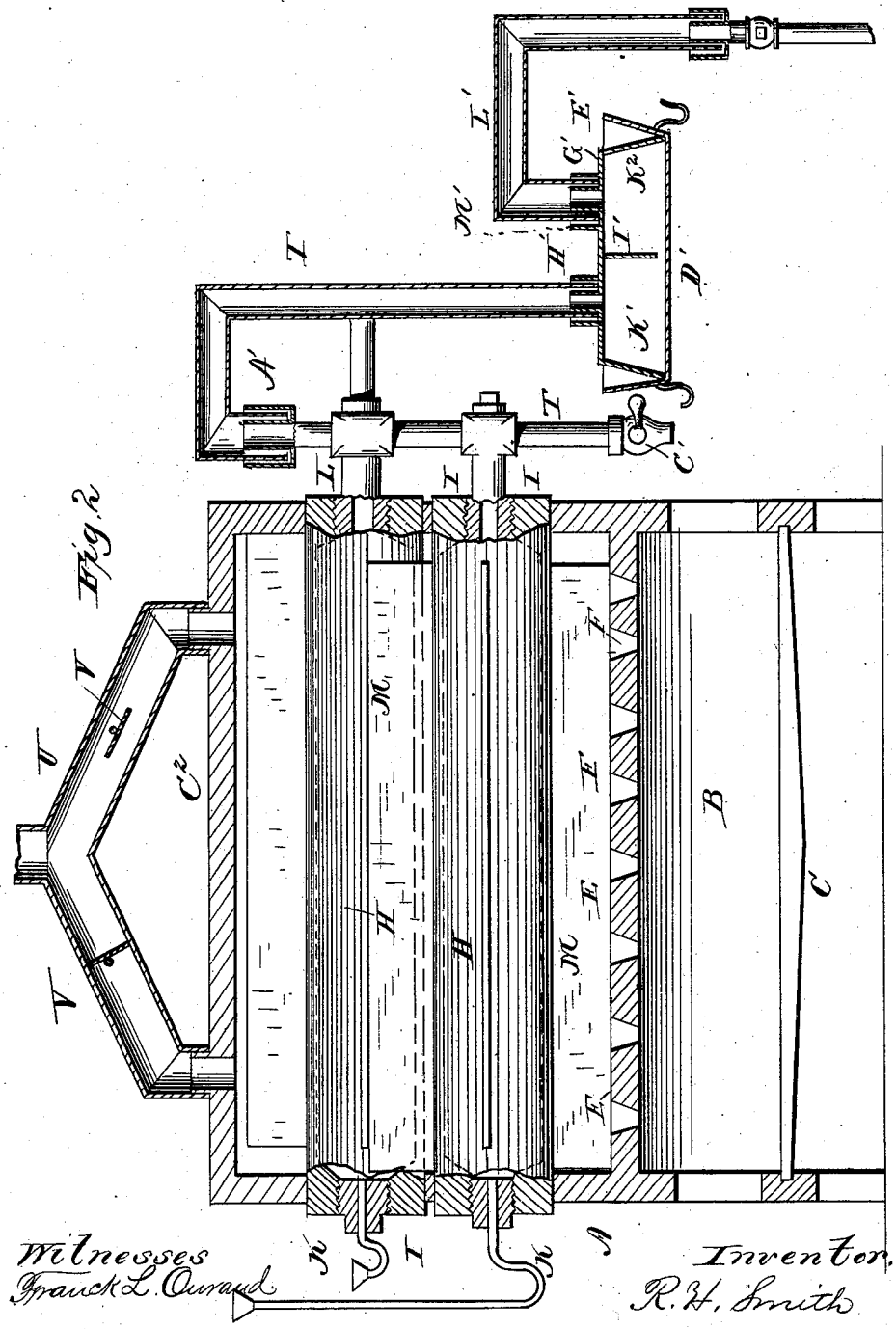

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(No Model.) 3 Sheets—Sheet 3.

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GAS APPARATUS.

No. 260,712. Patented July 4, 1882.

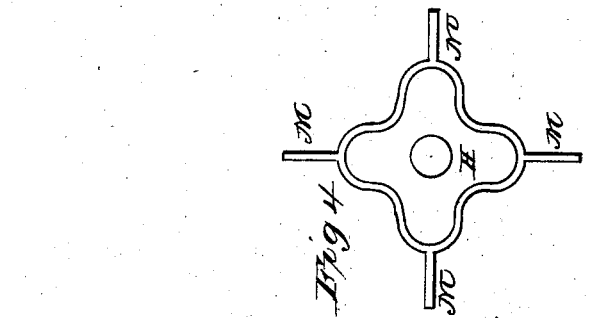

Fig 4.

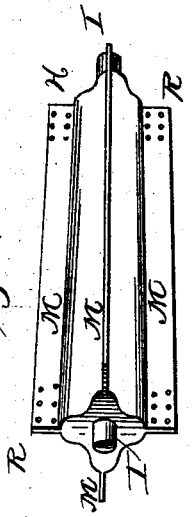

Fig. 5.

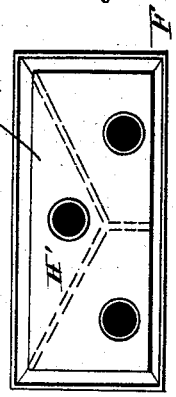

Fig. 9.

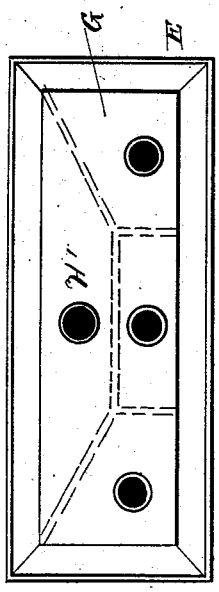

Fig 6

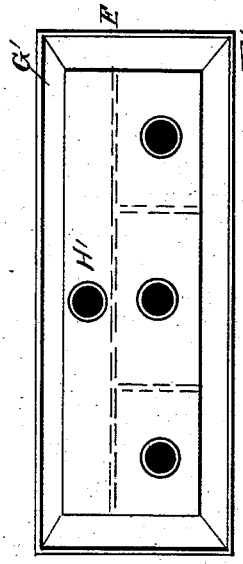

Fig. 7

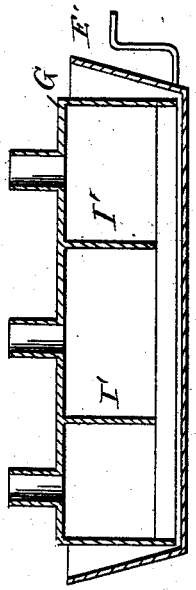

Fig. 8

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UNITED STATES PATENT OFFICE.

ROLAND H. SMITH, OF PITTSBURG, PENNSYLVANIA.

GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 260,712, dated July 4, 1882.

Application filed April 13, 1881. (No model.)

To all whom it may concern:

Be it known that I, ROLAND H. SMITH, of Pittsburg, in the county of Allegheny, and in the State of Pennsylvania, have invented certain new and useful Improvements in Gas Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to certain improvements in gas apparatus; and it has for its objects to provide an improved system of apparatus and a retort of improved construction, and means for setting a series of such retorts in a bench, so as to form a system of flues, whereby the products of combustion from the fire-box may be conducted around the retorts and the heat thoroughly utilized, as more fully hereinafter specified. These objects I attain by the apparatus illustrated in the accompanying drawings, in which—

Figure 1 represents a transverse vertical section of my improved apparatus; Fig. 2, a vertical sectional view taken longitudinally through the apparatus; Fig. 3, a detached sectional view of one of the retorts; Fig. 4, a cross-section of a modification of one of the retorts; Fig. 5, a top view of such modified form, and Figs. 6, 7, 8, and 9 represent views of the washer detached. Fig. 10 is a transverse vertical section of a pair of retorts.

The letter A indicates the furnace, which is constructed of brick-work or other suitable material; B, the fire-box, and C the ash-pit. The top C^2 of the furnace is arched and constructed in two parts, which are hinged at D to the vertical sides of the furnace, and which meet at the center of the furnace when closed. These permit the interior of the furnace to be reached at any time for the purpose of repairs. Above the fire-box is formed an arch, E, which is perforated, as indicated by the letter F, to permit the products of combustion to pass up into the retort-chamber G.

The letter H indicates the retorts, which are contracted at each end where they set in the walls of the furnace, as indicated by the letter I, so as to expose as little surface as possible to a low temperature. The contracted ends serve as supports to the retorts and for the introduction of the supply and discharge pipes K and L.

The retorts are provided each with four longitudinal flanges, M, which radiate from equidistant points on the peripheries or outer walls of the retorts. These flanges do not extend the full length of the retort, but terminate some distance from one end, so as to permit the retort to be readily removed from its seat by drawing it back or forth for the purpose of repairs, and to permit the passage of the products through the flues formed by the retorts and flanges when the retorts are set in a bench. The retorts are set in a bench of three or more, as indicated in Fig. 1 of the drawings, with the lower flanges of the lower retorts resting upon the perforated arch and their adjoining flanges meeting the flanges setting against the walls of the furnace. The side flanges of the upper retort rest upon the upper flanges of the lower retorts, and the lower flange of the upper retort rests upon the adjoining flanges of the lower retorts, the retorts and their flanges forming a system of flues, N, which communicate alternately at opposite ends, as shown in Fig. 2 of the drawings.

The letter P indicates a series of openings in the walls of the furnace, through which the interior may be observed.

The retorts are preferably made bulging toward the center, to better adapt them to the contraction and expansion occasioned by variations of temperature. They are usually approximately cylindrical in cross-section, but they may be made of any other shape—for instance, as indicated in Fig. 4 of the drawings. They may in some instances be made tapering, as indicated in Fig. 5, to permit of their ready withdrawal from the furnace, the pipe-connections being first removed and the retort then withdrawn at its larger end without taking down any portion of the furnace. In some instances the flanges may extend the whole length of the retort, in which case they are perforated at the ends, as indicated by the letter R, to establish communication between the flues.

The letter K indicates the oil-supply pipes, and T the stand-pipes communicating with the washer, which may be of any suitable description.

U indicates the escape-flue, which consists

of two branches starting from opposite ends of the furnace and uniting in a common pipe, the branches being provided with suitable dampers, V, whereby the products of combustion may be passed from either end or both ends of the furnace, in order to prevent either end of the retorts from being heated too hot.

The letter A′ indicates an annular seal at the upper end of the stand-pipe T, which connects with the discharge-pipes L, leading from the retorts. The lower end of the stand-pipe is provided with a cock, C′, for the discharge of tar, when necessary.

The letter D′ indicates the washer. This consists of a rectangular vessel, E′, having an inverted vessel, G′, which connects with the stand-pipe by means of a bent pipe, F′, its lower end setting in a seal, H′, on top of the vessel G′. The said vessel G′ is divided by means of a partition, I′, extending nearly to the bottom into two or more compartments, K′ K², one compartment being connected with the pipe L′ by means of the annular seal M′. The compartments K′ correspond in number with the number of stand-pipes and their connected retorts, and the gas is passed under the edge of the partition on its way to the discharge-compartment K².

The arches forming the top of the furnace are constructed of flanged iron plates, with a lining of brick-work or fire-clay between the flanges.

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

1. A retort provided with four longitudinal flanges on the outside radiating from equidistant points, substantially as and for the purposes specified.

2. In combination with the furnace, the flanged retorts, set as described, and forming a series of flues, whereby the products of combustion are carried around said retorts and the heat is thoroughly utilized.

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of March, 1881.

ROLAND H. SMITH.

Witnesses:
ANDREW HUMBERT,
ED. A. ROHRKASTE.