

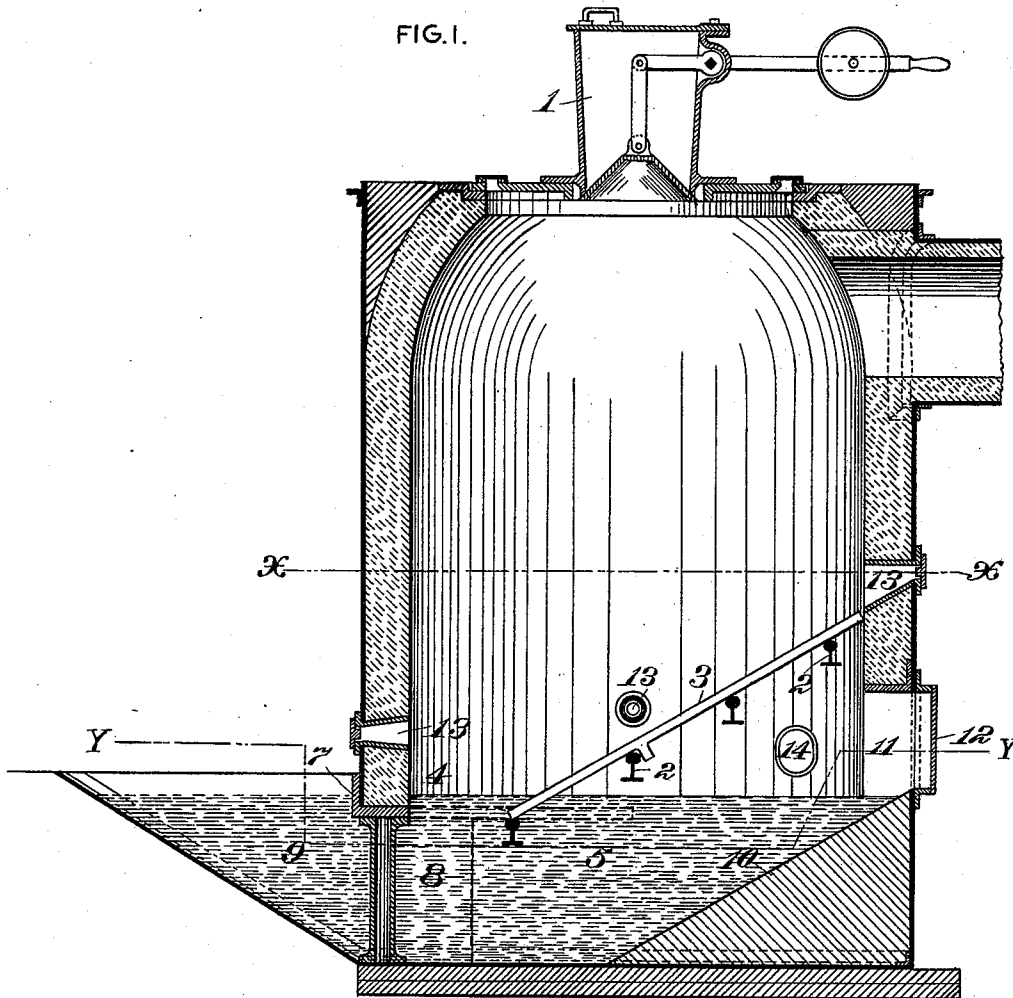
(No Model.)

3 Sheets—Sheet 1.

S. R. SMYTHE.  
GAS PRODUCER.

No. 541,640.

Patented June 25, 1895.



WITNESSES:

*Chas F Miller*  
*J. E. Gaither*

INVENTOR

*Samuel R. Smythe*

BY

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ATTORNEY.

(No Model.)

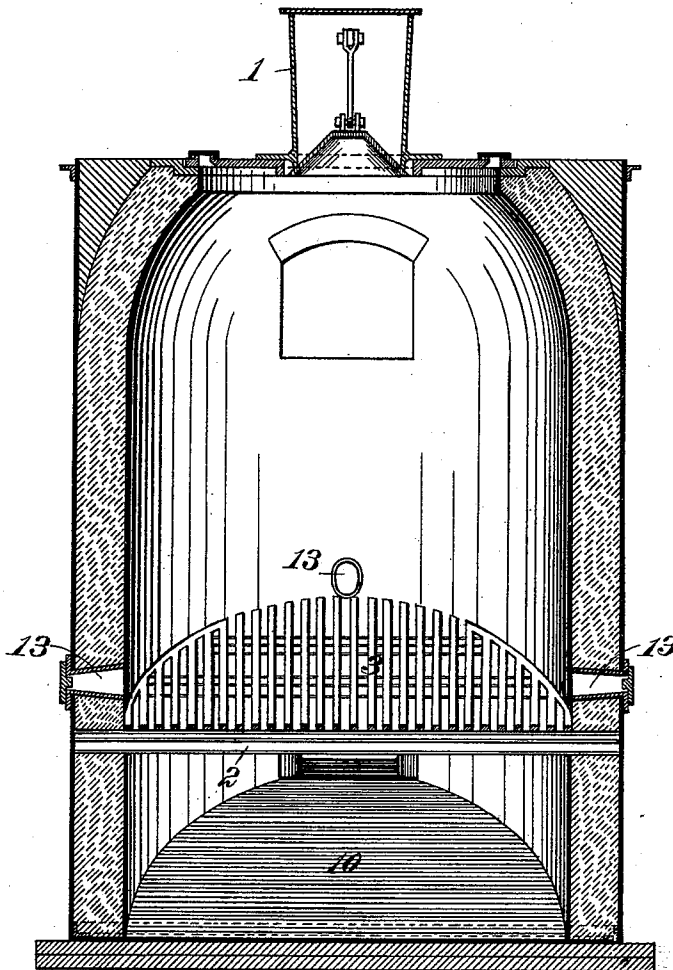
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FIG. 2.



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(No Model.)

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FIG. 3.

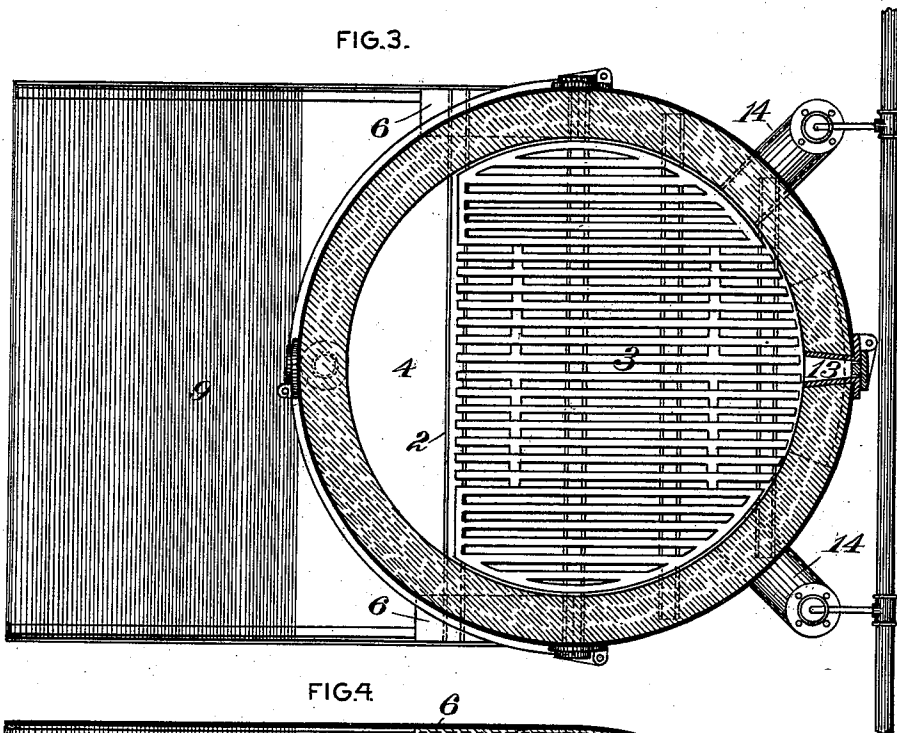
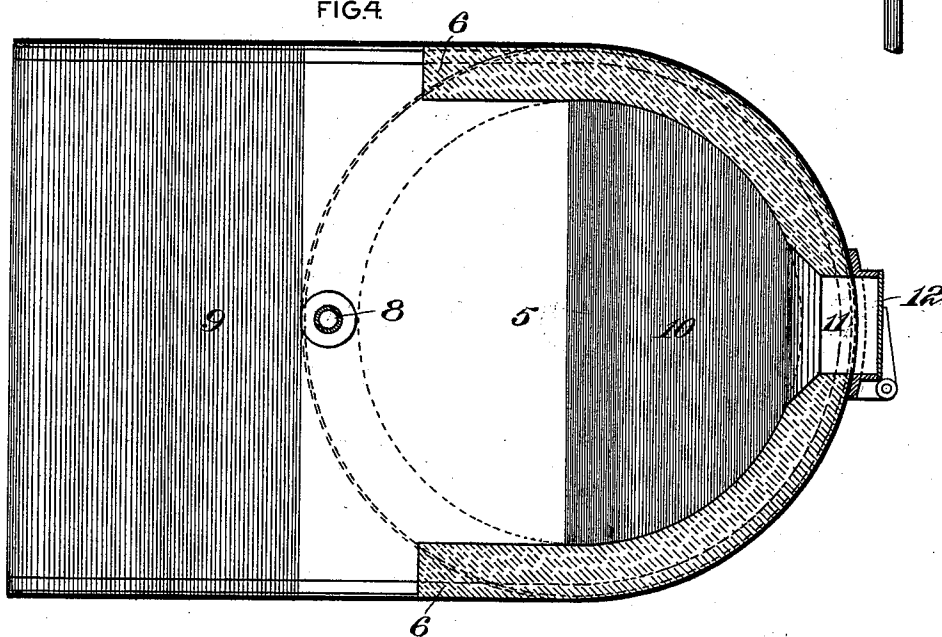


FIG. 4.



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# UNITED STATES PATENT OFFICE.

SAMUEL R. SMYTHE, OF PITTSBURG, PENNSYLVANIA.

## GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 541,640, dated June 25, 1895.

Application filed October 1, 1894. Serial No. 524,611. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL R. SMYTHE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Gas-Producers, of which improvements the following is a specification.

The invention described herein relates to certain improvements in gas producers, and has for its object a construction whereby the operation of the producer may be practically continuous and whereby a larger grate surface and consequent larger blast area may be obtained.

In general terms, the invention consists in the construction and combination, substantially as hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of my improved producer. Fig. 2 is a similar view, the plane of section being at right angles to that on which Fig. 1 is taken. Figs. 3 and 4 are sectional plan views, the planes of section being indicated by the lines *xx* and *yy*, respectively, of Fig. 1.

In the practice of my invention the producer is made as regards its interior walls either round or square, preferably the former, and of the same internal dimensions throughout its entire height, except at its upper end, where the walls curve or incline inwardly for a short distance. In other words, the producer is made interiorly of a bee-hive shape, or approximately so, and is provided at its upper end with a feed hopper 1, of the usual or any other suitable construction.

A series of beams or rails 2 are arranged across the producer for supporting the grate 3. The beams or rails 2 are arranged at different heights, so that the grate 3 will be inclined downwardly from the back toward the front of the producer. The grate does not extend to the front wall of the producer, so that a segmental opening 4 is formed along the front edge of the grate and between it and the front wall of the producer, for the passage of ashes, &c., into space or pit 5, below the grate. In order to provide for the removal of the ashes from the pit 5, a portion of the front wall at the lower end of the producer

is cut away, and at the sides of said opening tangential or wing walls 6 are formed for supporting the fore plate 7 on which the portion of the wall of the producer above the opening rests. The fore plate is supported intermediate of the wing walls by one or more posts 8. In front of this opening in the wall of the producer is formed a pit 9, the bottom of which inclines upwardly from the producer. The walls of the pit 9 are made of such a height that the lower end of the front wall of the producer and the front portion of the grate can be immersed a sufficient distance in the water contained in the pits 5 and 9, to form an efficient water seal, as shown in Fig. 1.

As shown in Figs. 1, 2 and 4, the portion of the bottom of the pit 5 inclines downward from the back toward the front of the producer, as shown at 10, so that the ashes falling through the grate will slide toward the front of the pit, so that they can be readily removed. At the upper end of the inclined portion 10, an opening 11 is formed through the wall of the producer for the removal of ashes, or for the insertion of tools for pushing the ashes to the front of the pit 5. The opening 11 is normally closed by a door 12. A series of openings 13 are provided with doors which are formed through the wall of the producer at suitable points, for the insertion of tools for stirring up the charge, cleaning the grates, &c.

Blast pipes 14 are inserted through the walls of the producer into the blast chamber 15 formed by the grate and the upper surface of the water in the pit.

In the operation of the producer, ashes, &c., will slide down the grate through the segmental opening 4, and gradually accumulating in the pit below the opening, will in connection with the water, form an effectual seal as against the escape of air. In removing ashes, care must be taken not to remove such a quantity as will leave the water surrounding the lower portion of the wall of the producer, unsupported or weighted by ashes.

It is characteristic of my improvement that a grate approximately equal in dimensions to the horizontal dimensions of the producer at its largest portion, can be employed, thereby greatly increasing the available blast or gas generating area; and, further, as the

grate is subjected to active heat on one side only, it need not be renewed except at long intervals, so that the gas generation is practically continuous.

- 5 It is characteristic of my improvement that the blast chamber beneath the grate is formed in part by the water in the sealing pit and in part by the column of ashes descending through the opening between the edge of said  
10 grate and the side of the producer. This construction permits of the ready removal of the ashes which pass down through the grate, and also permits of the backing up of the column of ashes descending through the opening into  
15 the ash pit, into the portion of the pit under the grate whereby the effective blast area of said grate is reduced and regulated.

I claim herein as my invention—

- 20 1. A gas producer having straight or approximately straight internal walls provided with an opening at its lower end, a pit for water arranged in line with said opening and extending back into the producer and under the grate thereof, the outer wall of the open-  
25 ing in said producer being immersed in water

contained in the pit, in combination with a segmental grate extending entirely across the producer, except adjacent to the wall having the opening therein, thereby forming an opening for the descent of the body of ashes 30 which in connection with the water in the pit will form a hermetic wall preventing the escape of air and steam from the producer, substantially as set forth.

2. A gas producer having straight or ap- 35 proximately straight internal walls and provided with an opening at its lower end, a pit for water arranged in line with said opening and extending back into the producer under the grate, the upper wall of the opening in 40 said producer being immersed in water contained in the pit, in combination with an inclined segmental grate, substantially as set forth.

In testimony whereof I have hereunto set 45 my hand.

SAMUEL R. SMYTHE.

Witnesses:

DARWIN S. WOLCOTT,  
F. E. GAITHER.