

No. 651,678.

Patented June 12, 1900.

J. SWINBANK.  
GAS PRODUCER.

(Application filed Nov. 24, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

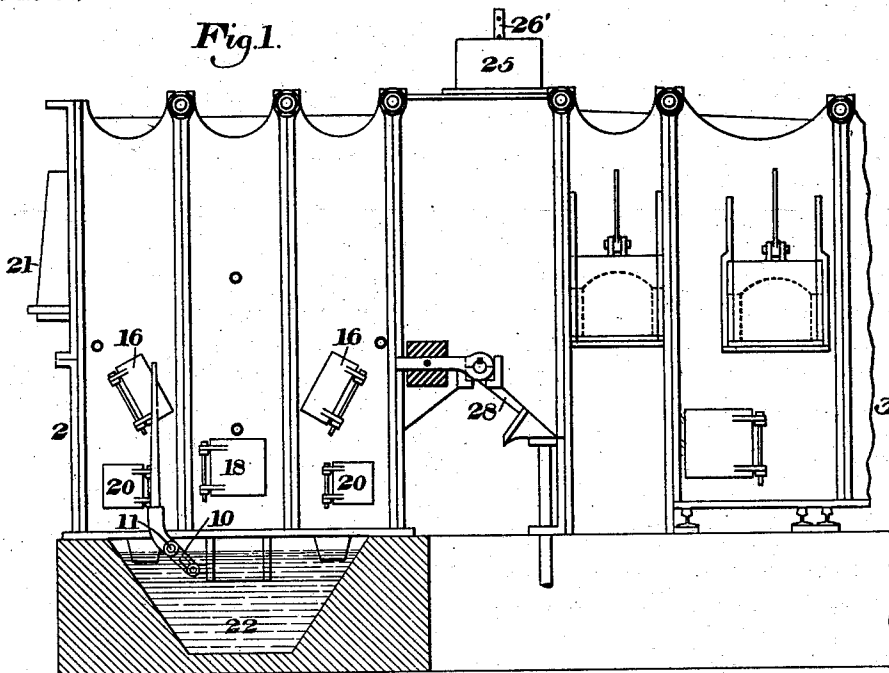
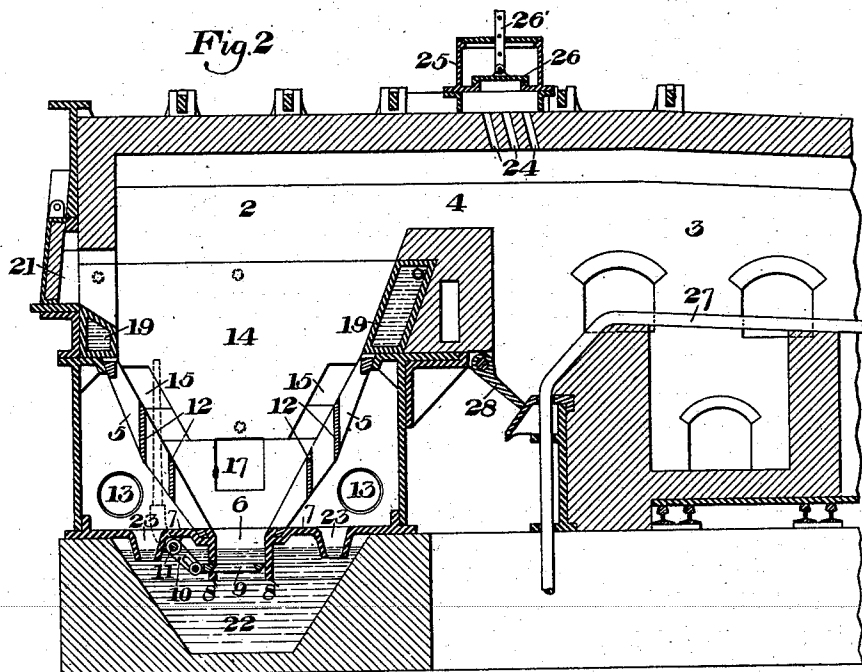


Fig. 2.



WITNESSES

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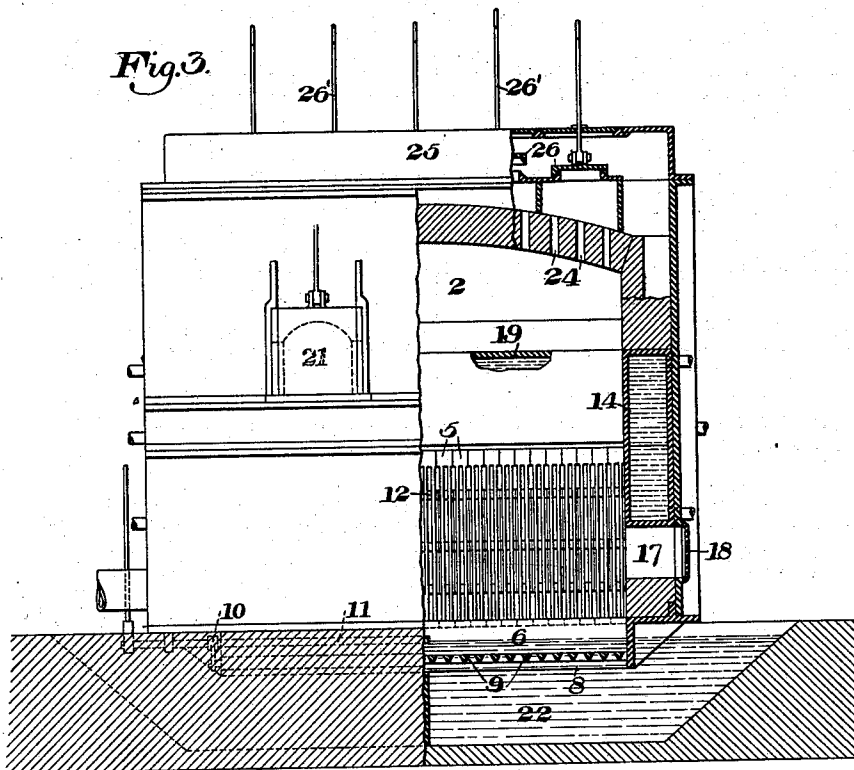
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# UNITED STATES PATENT OFFICE.

JOHN SWINBANK, OF PITTSBURG, PENNSYLVANIA.

## GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 651,678, dated June 12, 1900.

Application filed November 24, 1899. Serial No. 733,128. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN SWINBANK, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Producers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in section, showing my improved producer in connection with a reheating-furnace. Fig. 2 is a longitudinal vertical section of the same; and Fig. 3 is an end elevation, partly in section, of the producer.

My invention relates to gas-producers, and is designed to prevent burning of the combustible gases within the producer itself, to more evenly distribute the blast throughout the coke-bed, and hence better extract the gases, and to improve the economy and reduce the cost of operation of these producers.

In the drawings, 2 represents the producer, which may be of square or any other desired form and which I have shown as connecting with the reheating-furnace 3 through a port 4 in the upper part of the producer. The grates 5 5 in the lower portion of the producer are downwardly and inwardly inclined, leaving a transverse opening 6 at the bottom. These grates rest upon bottom plates 7 7, having depending flanges 8 below the central grate-opening, which opening is normally closed by a horizontally-movable grate 9, having loose pivotal connections with levers 10, secured to rock-shaft 11, operated from the outside of the producer.

The grate-bars are provided with longitudinal openings, and these openings are subdivided by vertical webs 12, which are spaced apart, so as to divide the blast and direct it upwardly through all parts of the fuel. This is an important feature of my invention, as heretofore the blast has been directed toward the center of the bed and has not been spread upwardly over the different parts, as in my construction. To still further aid in this action of supplying the blast to all parts of the bed, I provide two air-blast pipes 13 13, which lead through one side wall of the producer into the chambers below the two grates.

In order to prevent the heat in the fuel-bed from becoming too intense under the forced blast, I provide water-boxes, which are built into the producer-walls. The two boxes 14 14 at the sides of the producers extend down within the grate portion and are made somewhat narrower than the space between the grates to leave openings 15 next to each grate for loosening up clinkers and aiding the descent of the charge. These openings are closed by doors 16 at each side. Openings 17 are also provided in the sides midway between the grates and below the water-boxes and which are closed by suitable doors 18. Through these openings access may be had to the central portion of the fuel-bed to loosen it up as desired. The other water-boxes 19 are above the tops of the grates and complete the water-cooled belt around the fuel-bed above the grates. The water is separately supplied to each water-box by a pipe leading to the lower part of one end and led away by a pipe from the upper part of the other end, thus maintaining a constant circulation of water through the boxes and keeping the temperature of the bed down at the desired point. Openings are provided beneath the grate-bars and opposite the blast-openings and which are closed by suitable doors 20.

The fuel is introduced by suitable openings 21 at the front end of the producer. The gas-producer is provided with an ordinary water-sealing pit 22, the water being preferably kept at a level slightly above the movable grate 9. Openings 23 are provided in the floor of the producer and are provided with lips projecting down into the water, thus allowing any ashes or refuse to pass down into the ash-pit.

To supply air to combine with the gases passing through the port 4 and burning within the heating-furnace, I provide inclined openings 24 in the roof above the port, these openings communicating with an air-box 25, divided transversely in separate sections, each containing a vertically-movable controlling-valve 26, with stem 26'.

The reheating-furnace may be of any desired type, and I have shown it as provided with longitudinal supports 27, along which

the billets are moved, they passing out through the gate-controlled opening 28 and dropping upon any suitable conveyer.

The producer is operated in the usual manner, and the blast passing in through the two pipes, one under each grate, is subdivided by the vertical webs of the grates, and thus spread uniformly throughout the fuel-bed. The heat of the bed is kept down by the water-boxes, and the gases evolved pass off through the port 4, and uniting with the air passing in through the top openings 24 burn within the heating-furnace. The ashes and refuse descending between the grates are supported upon the movable grate, which is drawn back whenever desirable to allow them to drop into the ash-pit.

The advantages of my invention result from the dividing up of the blast by the use of the plurality of air-inlets and by the construction of the grate-bars, which further split up the blast and direct it upwardly, from the use of the cooling devices, which lower the temperature of the fuel-bed and prevent the usual intense heat, which burns up the gases generated, and, further, from the arrangement and location of the grates with the central transverse opening between them, which is controlled by the movable grate or support. Many changes may be made in the form and arrangement of the parts without departing from my invention, since

I claim—

1. A gas-producer having opposite downwardly and inwardly inclined grates, a blast-pipe situate beneath each grate, a water seal, a discharge-opening between the lower ends

of the grates, a movable support or closure within said discharge-opening and below the level of the water in the water seal, and means for opening and closing the removable support; substantially as described.

2. A gas-producer having opposite downwardly and inwardly inclined grates, a blast-pipe situate beneath each grate, a floor, a water seal, a discharge-opening between the grates and discharge-openings in the floor, said openings extending below the surface of the water in the water seal; substantially as described.

3. A gas-producer having opposite downwardly-inclined grates, cooling-boxes above the grates, the side boxes extending downwardly within the grates; substantially as described.

4. A gas-producer having opposite downwardly and inwardly inclined grates, with a central opening between their lower ends, plates projecting downward from said openings into a water-sealing pit, and a movable gate or closure for said discharge-opening; substantially as described.

5. A gas-producer having a downwardly-inclined grate a blast-pipe beneath the grate, a water seal into which the grate extends, and a movable support at the lower end of the grate and beneath the level of the water in the water seal; substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN SWINBANK.

Witnesses:

H. M. CORWIN,  
GEORGE B. BLEMMING.