

1,053,737.

Fig. 2.

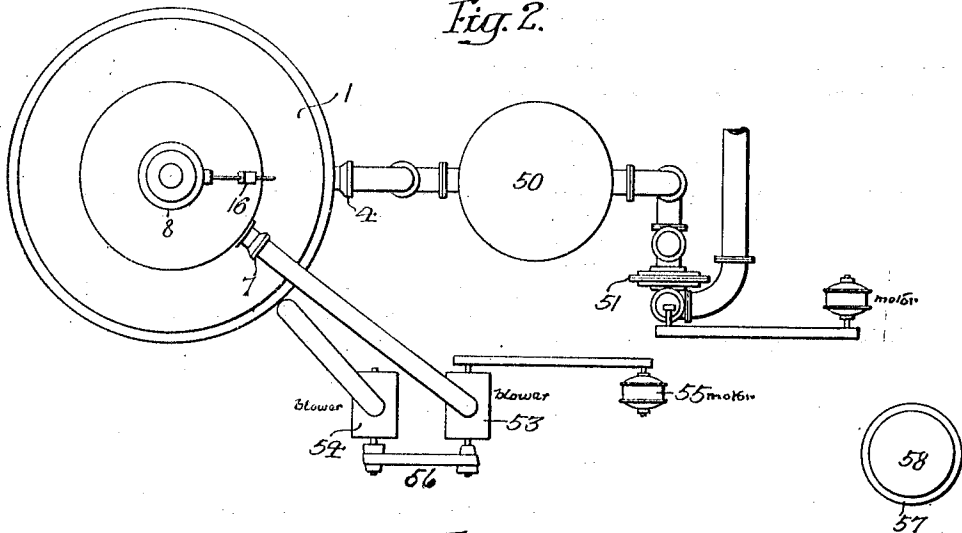
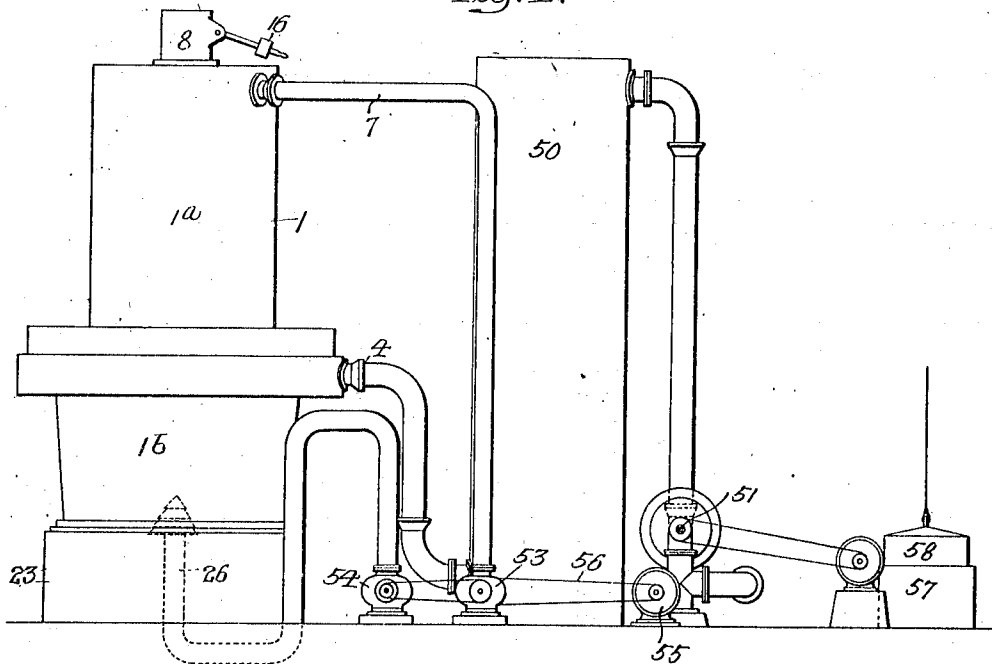


Fig. 1.



Witnesses:
 Walter Cullinger
 Willie A. Burrows

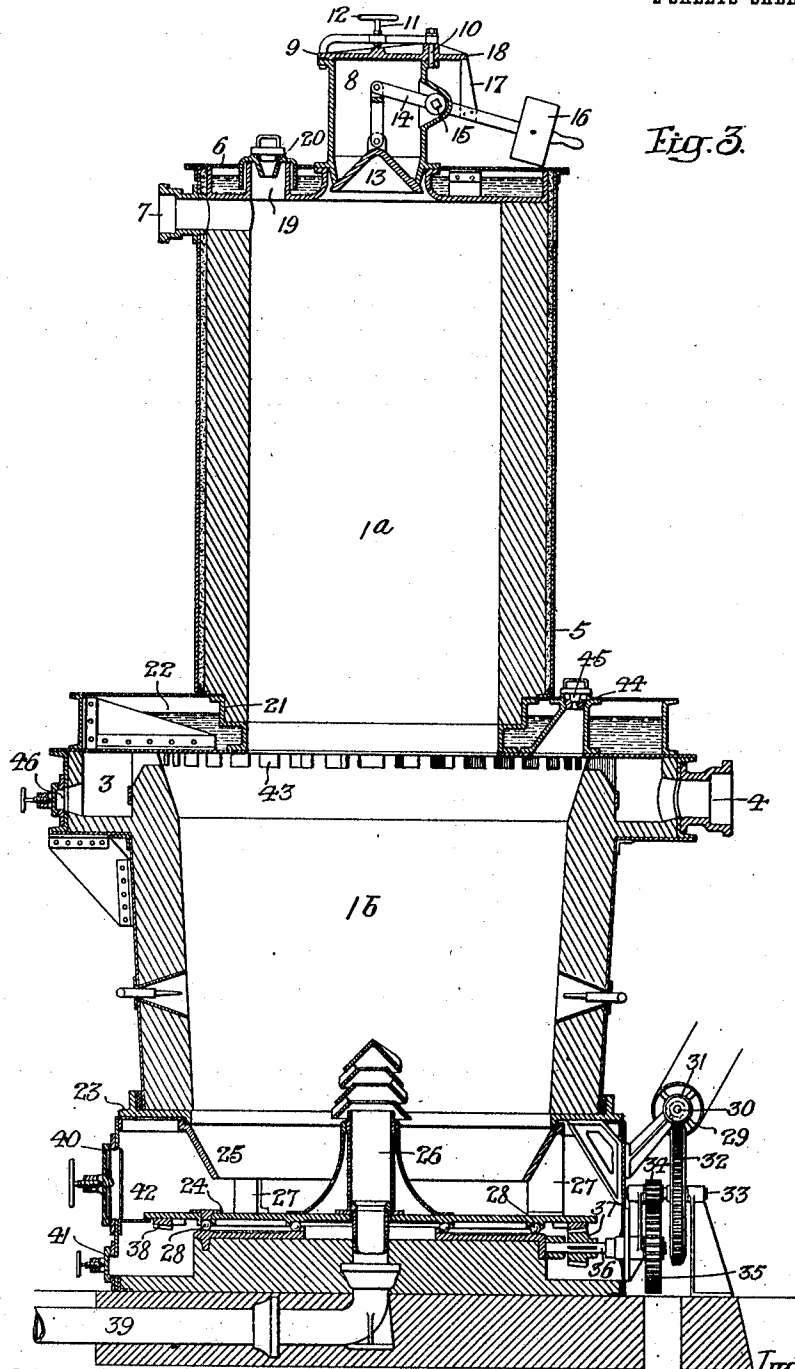
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GAS PRODUCER.
APPLICATION FILED AUG. 11, 1910.

1,053,737.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FREDERICK V. MATTON, OF ATLANTIC CITY, NEW JERSEY, ASSIGNOR TO CAMDEN IRON WORKS, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

GAS-PRODUCER.

1,053,737.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed August 11, 1910. Serial No. 576,647.

To all whom it may concern:

Be it known that I, FREDERICK V. MATTON, a subject of the King of Sweden, and a resident of Atlantic City, Atlantic county, New Jersey, have invented certain Improvements in Gas-Producers, of which the following is a specification.

My invention relates to gas producers, and one object of my invention is to provide a producer capable of making gas from bituminous coal that will be free from tar. To this end I provide a structure which may be termed a double zone producer, having means for introducing blasts, which may be in fixed proportions, above and below the fuel bed; the gaseous product being taken off from a point intermediate the top and bottom of the producer and between the blast inlets.

A further feature of my invention is an improved rotatable bottom or grate and bosh plate.

These and other features of my invention are more fully pointed out hereinafter, reference being had to the accompanying drawings, in which:

Figure 1, is a side elevation of my improved gas producer, showing means for the separate introduction of a plurality of blasts of steam and air; Fig. 2, is a plan view of the same, and Fig. 3, is a vertical section, on an enlarged scale, of my improved gas producer.

It has been proposed to introduce blasts of air and steam at independent points, top and bottom for instance, in gas producers, but the constructions heretofore adopted have been faulty and the degree of efficiency has been relatively slight. In the producer constructed in accordance with my invention, the previous defects have been overcome and I have developed a producer of great efficiency, materially increasing the assurance of producing uniform tar free gas from bituminous coals or other fuels rich in volatile matters.

In my improved producer, I have provided a vertical shell or stack 1, having upper and lower sections 1^a and 1^b, forming

communicating chambers, the lower section being of greater diameter but less in height than the upper section, and between the sections an annular chamber 3 is provided for receiving the gas developed from the incomplete combustion of the fuel, which gas may be discharged from said chamber 3, through a suitable outlet as 4.

The section 1^a of the furnace may be substantially cylindrical and much less in diameter than section 1^b besides being of greater length or depth. It may be of the usual firebrick construction inclosed in a metal shell 5, and is provided with a metal top 6, preferably hollow for the reception of a cooling medium, such as water. Just below the top an opening 7 is provided for the reception of a blast of air and steam to assist and support combustion in the upper zone of the producer in which a fire may be maintained.

The top 6, of the upper section may carry a suitable form of charging bell and hopper, in the present instance, a hopper 8 is provided, normally closed when the producer is under way, with a cover 9 which may be pivoted at 10 and held down by a screw 11 with a suitable hand wheel 12 for turning such screw. The bell 13 may be carried by a lever 14 pivoted at 15 to the hopper, and having a suitable weight 16. This lever may also carry an arm 17, resting under a projection 18 of the cover 9 when the latter is closed, so that the bell is locked against movement when the cover is in this position.

The top of the upper section may be provided with suitable poke holes 19, closed by suitable covers 20, one of which is shown, and as many of these poke holes as may be required will be provided. The lower portion of the upper section fits within a metal ring 21 forming the inner wall of a receptacle 22 surmounting the lower section and forming a part of the connecting means for said sections, such receptacle containing water for the production of steam which may be introduced into the producer with the blasts of air.

The lower section 1^b is slightly larger at

the top than at the bottom, being in the form of a truncated cone, and it may be supported by a suitable casing 23, within which an ash table 24 and bosh 25 are located; the ash table carrying a hooded blast pipe 26 of usual type. In my improved construction the bosh may taper inwardly from the top of the same to contract the body of ash below the burning fuel, and it is carried by the ash table, suitable supports, as those indicated at 27 being provided for the purpose. The ash table is rotatable, and in the present instance it may be mounted upon a series of balls or rollers to reduce friction, balls being indicated at 28 for such purpose.

The table may be moved at a rate of speed suitable for agitating the superimposed body of fuel, and suitable means may be provided to drive the table, power being applied to a pulley 29 in the present instance. This pulley may be carried by a shaft 30 having a worm 31 in driving engagement with a worm wheel 32 carried by a shaft or spindle 33, which in turn carries a pinion 34 meshing with a gear wheel 35 carried by a shaft 36; and suitably connected with said shaft 36, being disposed within the casing 23, is a bevel pinion 37 in driving engagement with a rack 38 carried by the ash table. The bosh travels with the ash table, and this movement of the ash and lower part of the mass of burning material within the producer tends to prevent the formation of air channels within the mass of fuel, thus promoting a more uniform distribution of blast throughout the same. An air and steam delivery pipe 39 leads to the blast pipe, but stops at a point substantially the level of the ash table; the blast pipe 26 revolving with said table while the inlet pipe may be fixedly mounted in the base of the structure.

The casing 23 is provided with doors 40 and 41, for the removal of ash from the producer, and a suitable bridge piece 42 may be arranged between the ash table and the door 40; the main bulk of the ash being removed through this door while portions falling off the ash table may be withdrawn through the door 41.

The upper section 1^a of the producer partially overlies the lower section; the latter forming a baffle providing for a space between the mass of burning fuel and the wall of the section, and at the upper portion of this lower section I provide outlets 43 for the passage of gas from said section to the chamber 3. Mounted above said chamber and supporting the upper section of the producer is the chamber 22 containing water, and suitable poke holes 44 may be formed in this chamber, closed when not in use by the covers 45. For the purpose of removing any

tarry matter which may collect in the gas chamber, I may provide the latter with openings 46, suitably closed when not in use. The gas delivered by the producer may pass to a suitable scrubber 50, thence to an exhaustor 51 for delivery to a gas engine or other point. For introducing the independent blasts of air and steam to the producer I may employ separate blowers of a positive type, indicated at 53 and 54 respectively in Figs. 1 and 2, which blowers may be driven by any suitable means. In the present instance I have shown a power mechanism for driving the blowers, said mechanism consisting of a motor 55 driving the blower 53, with a belt 56 connecting the blower 54 so that it may be driven from 53. Included in the driving means I have shown cone pulleys, reversed with respect to each other, so that variations in the speed of the separate blowers with consequent fixed variations of the volume of the blasts of air and steam delivered to the producer may be readily provided for, such arrangement permitting delivery of blasts of air and steam in equal volumes to both zones of the producer, or a greater amount to the lower section, with a lesser amount to the upper section, and vice versa.

If desired the gas delivered may determine the speed of the motor driving the blowers, and for this purpose I may provide a governor in the form of a gas container 57 having a movable shell 58, to which a portion of the producer gas may be delivered; the movable shell 58 of such structure being suitably connected to the motor driving the blowers. The upward movement of such shell will tend to cut down the speed of the blower motor while the lowering of such shell will cause an accelerated movement of such motor.

It will of course be understood that I may employ any means for varying the speed of the blowers with relation to each other so as to effect the desired variations in the amount of the blasts of air and steam delivered to the different zones of the producer.

It will be understood, of course, that the delivery of the blasts of air and steam is so controlled that either one may be increased or diminished without affecting the other, and that increase in one may be followed by decrease in the other and vice versa; the object to be attained being such combustion of the bituminous coal or other fuel as to obtain a maximum quantity of tar free gas.

I claim:

In a gas producer of the character described, having independent sections and a gas chamber intermediate thereof and in

communication with one of said sections,
means for independently delivering volumes
of air and steam to said sections, separate
blowers controlling the delivery to the re-
5 spective sections, and power mechanism for
driving the blowers, said mechanism includ-
ing a change-speed device interposed be-
tween and directly connecting said blowers
whereby the blowers operate in unison and

the delivery of each blower with respect to 10
the other is regulated.

In testimony whereof, I have signed my
name to this specification, in the presence of
two subscribing witnesses.

FRED. V. MATTON.

Witnesses:

ARTHUR J. PURSELL,
MURRAY C. BOYER.