

(No Model.)

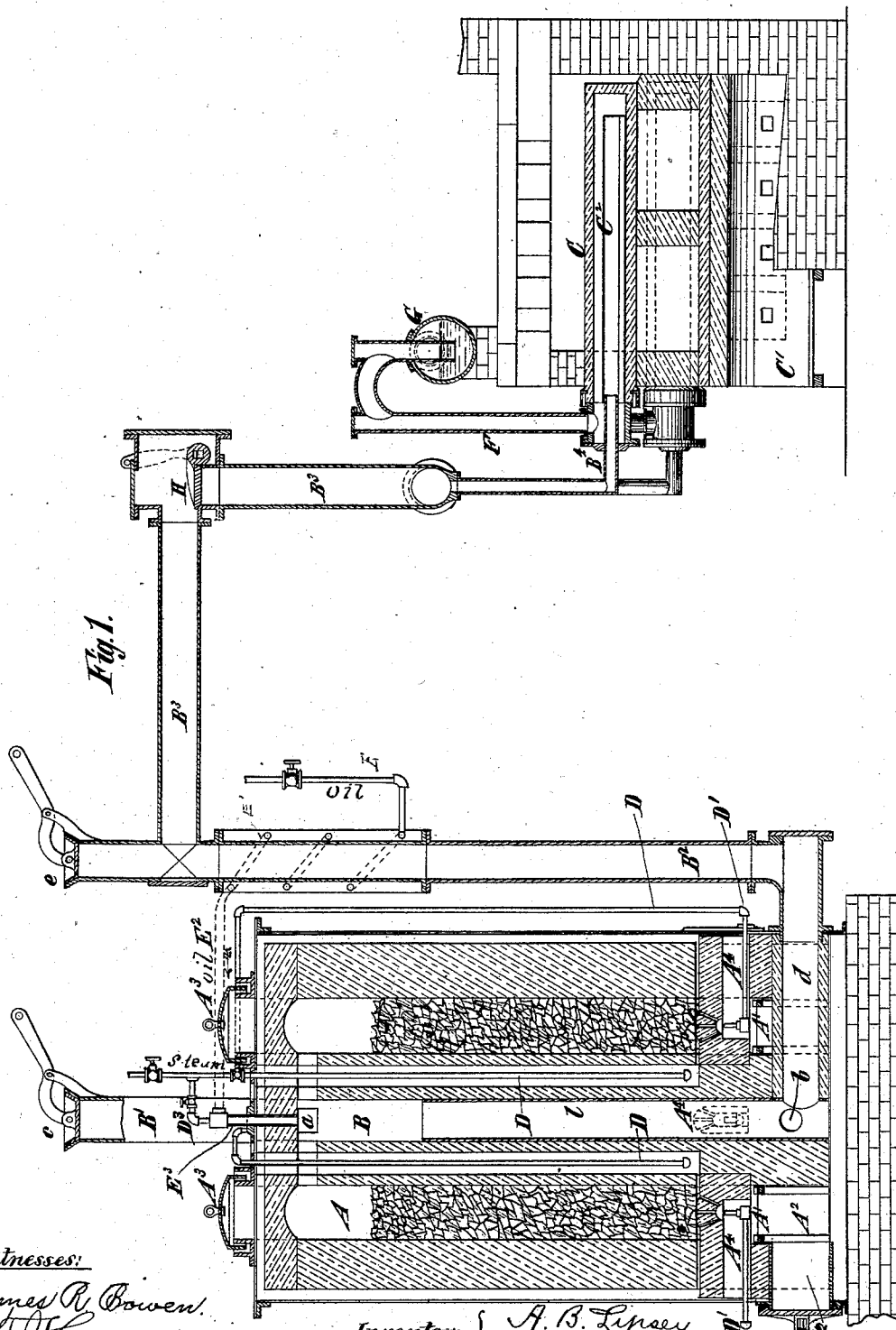
2 Sheets—Sheet 1.

A. B. LIPSEY.

APPARATUS FOR MANUFACTURING GAS.

No. 282,204.

Patented July 31, 1883.



Witnesses:  
James R. Bowen.  
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Inventor:

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(No Model.)

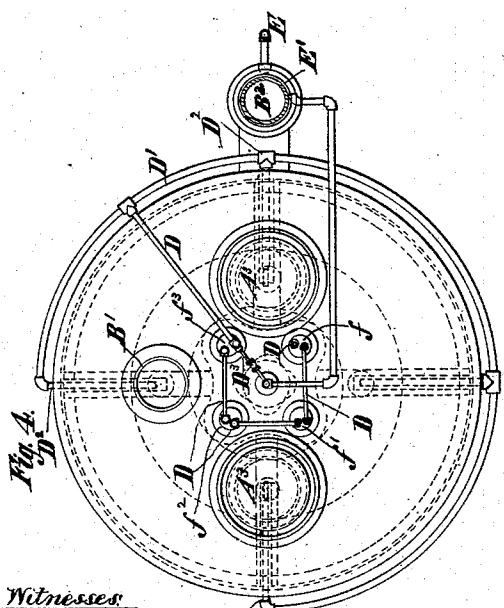
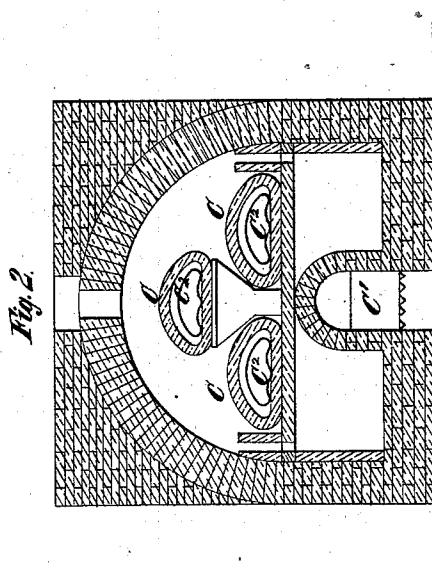
2 Sheets—Sheet 2

A. B. LIPSEY.

# APPARATUS FOR MANUFACTURING GAS.

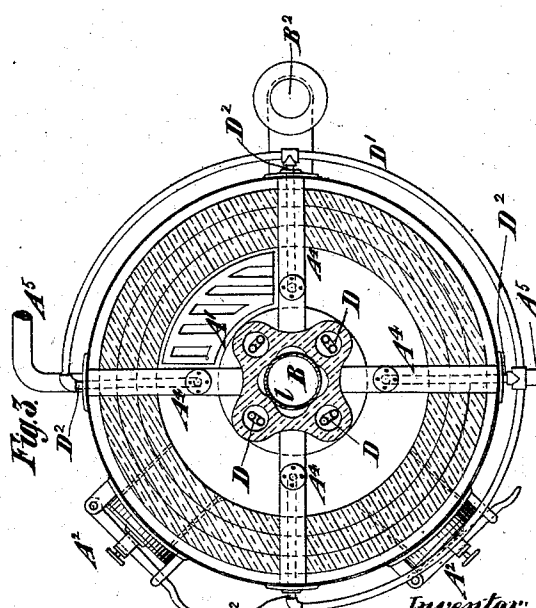
No. 282,204.

Patented July 31, 1883.



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# UNITED STATES PATENT OFFICE.

ANDREW B. LIPSEY, OF WEST HOBOKEN, NEW JERSEY, ASSIGNOR TO WILLIAM BELL, OF NEW YORK, N. Y.

## APPARATUS FOR MANUFACTURING GAS.

SPECIFICATION forming part of Letters Patent No. 282,204, dated July 31, 1883.

Application filed August 10, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW B. LIPSEY, of West Hoboken, in the county of Hudson and State of New Jersey, have invented a certain  
5 new and useful Improvement in Apparatus for Manufacturing Gas, of which the following is a specification.

My improvement consists in the combination, in an apparatus for manufacturing gas,  
10 of an annular generator provided with grate-bars forming an annular grate for supporting the material to be burned, and a column extending through the generator from top to bottom and containing an outlet-flue.

15 It also consists in the combination of an annular generator and a column arranged therein and containing an outlet-flue, which serves to conduct away the gas generated, and which communicates near the top of the column with  
20 the upper portion of the generator.

It also consists in the combination of an annular generator, a column arranged therein, and containing an outlet-flue which communicates with said generator, and a pipe for  
25 superheating steam, extending through said column, between the flue and the generator. The column is preferably made of less thickness between the portions through which the superheated pipe extends, so as to facilitate  
30 the heating of said pipe.

It also consists in the combination, with the generator, the column containing a flue which communicates with the generator, and the superheater-pipe extending through cavities in  
35 the column, of a pipe communicating with the superheater-pipe and extending around the generator, and pipes extending convergently from the pipe which extends around the generator to the generator for discharging the superheated steam into the generator.  
40

It also consists in the combination of a generator, a column arranged therein, and containing an outlet-flue which communicates with the upper part of said generator, a pipe for  
45 conducting naphtha connected with the upper end of said flue to commingle naphtha-vapor with the gas, and a pipe for conducting steam to said naphtha-pipe to hasten the passage of the naphtha.

It also consists in the combination of a generator, grate-bars, distributing-bars elevated  
50 above the level of the grate-bars, and pipes for conducting superheated steam under the distributing-bars, so that the latter may serve to distribute it above the level of the grate-bars.  
55 The distributing-bars are preferably perforated on their tops, and serve to cover and protect the pipes which deliver steam below them.

In the accompanying drawings, Figure 1 is a sectional elevation of an apparatus embodying  
60 my improvement. Fig. 2 is a transverse section of a portion of the same. Fig. 3 is a horizontal section of a portion of the apparatus, and Fig. 4 is a plan of the same.

Similar letters of reference designate corresponding parts in all the figures.  
65

A designates an annular generator or generating-chamber, which is provided at the lower end with grate-bars A', surmounting an ash-pit, A<sup>2</sup>. Coal may be introduced into this  
70 chamber through openings in the top fitted with covers A<sup>3</sup>, whose edges enter annular recesses adjacent to the openings and are sealed by sand therein. This chamber may be made  
75 of clay protected with fire-tiles. It may be covered by a shell of metal.

A<sup>4</sup> designates steam-distributing bars, of which there may be any desirable number, although in this example but four are shown.  
80 They may be made of fire-clay, and are preferably so combined with the chamber A that they may be slid into and out of the same. They extend up above the grate-bars A', and therefore the coal is at the sides, as well as  
85 above the same. They have convex perforated portions serving to distribute into the coal, above the level of the grate-bars A', steam admitted under the bars. The ash-pit A<sup>2</sup> is provided with lateral openings furnished with  
90 doors or covers, which control access to them. A<sup>5</sup> designates air-pipes conveying air from a blower to the ash-pit A<sup>2</sup>.

B designates a flue arranged concentrically within the chamber A, and formed in a column, which, as here shown, extends from top  
95 to bottom of the chamber. This flue may have a metal lining, *l*. The chamber A communicates with it through openings *a* in the

column. Near the lower end this flue communicates, through the agency of a passage, *b*, with a flue, *B'*, the exit from which is controlled by a cover, *c*. The flue *B*, near the lower end, also communicates with a passage, *d*, which leads to a delivery-flue, *B'*. This flue has at the top a cover, *e*, which controls the egress of gas from it, and it communicates near the top with a flue, *B''*, leading to retorts *C*, presently to be described.

*D* designates a pipe leading from a suitable steam-generator. It passes down a cavity, *f*, in the column which contains the flue *B*. It returns upwardly through the cavity, and then passes over the top of the chamber *A* to a cavity, *f'*, in the said column. It descends through this cavity and returns to the top of the said chamber, whence it passes to a cavity, *f''*, in the said column. It thence passes down this cavity and returns to the top of the chamber again. Next it passes to and down a cavity, *f'''*, in the said column. Returning, it passes to a pipe, *D'*, extending around the lower part of the exterior of the chamber *A*. From this pipe *D'* pipes *D''* extend radially into the distributing-bars *A'*, and at the ends are provided with nozzles from which the steam escapes. In this way the steam becomes highly superheated before entering the chamber *A*. As the steam enters above the level of the grate-bars the fire will not be so thoroughly chilled as if it entered lower down. Better results are attained by this feature. Preferably the column in which is the flue *B* is made of less thickness, as shown in Fig. 3, between the portions in which the cavities *f f' f'' f'''* are located, so as to facilitate the heating of the said cavities as much as possible.

*E* designates a pipe for conveying naphtha from an elevated source to a coil of pipe, *E'*, surrounding the flue *B''*. From the coil *E'* a pipe, *E''*, leads to a pipe, *E'''*, which enters the flue *B*.

*D'''* designates a pipe extending from the pipe *D* to the pipe *E'''*. In its passage through the coil *E'* the naphtha becomes vaporized, so that it can flow easily, and the jet of steam escaping from the pipe *D'''* into the pipe *E'''* hastens the flow of the naphtha.

The coal in the chamber *A* is ignited, and by means of the air-blast is brought to a very high degree of heat. When raised to the desired degree of heat the superheated steam is admitted and hydrogen gas generated. This gas, on entering the flue *B*, commingles with the vaporized naphtha and a rich illuminating-gas is formed. If the heat under which the two commingle is sufficient for the production of a "fixed gas," then the gas may be allowed to escape from the top of the flue *B'* to any suitable receptacle; but if this heat is insufficient for that purpose then the commingled gas and vapor will preferably be passed to the retorts *C*. The retorts, as here shown, are three in number, and may be made of fire-brick or other suitable material. They are subjected to the

heat produced by a furnace, *C'*. In each of the retorts are shells, *C''*, with which communicates a flue, *B'*, leading from the flue *B''*. These shells are considerably smaller than the retorts, and do not extend quite to the rear ends thereof. They are removable, and are supported solely by resting on the bottom of the retort. On the undersides they are corrugated, so that spaces will be left between the retorts and their under sides, as well as between the retorts and their other sides. The commingled gas and vapor pass through these shells to the rear ends and thence escape into the retorts. They then return along the spaces between the retorts and shells. They will together form a fixed gas before escaping from the retorts. Leaving the retorts they pass through a pipe, *F*, to a washer, *G*. They pass from the washer *G* to any suitable receptacle. The flue *B''* is provided with a valve, *H*, whereby communication between its horizontal and vertical portions is controlled. This valve is closed when the cover *e* of the flue *B'* is opened, and vice versa.

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

1. In an apparatus for manufacturing gas, the combination of an annular generator provided with grate-bars, forming an annular grate for supporting the material to be burned, and a column extending through the generator from top to bottom and containing an outlet-flue, substantially as specified.

2. The combination of an annular generator and a column arranged therein, which serves to conduct away the gas generated, and which has openings near the top communicating with the upper portion of said generator, substantially as specified.

3. The combination of an annular generator, a column arranged therein, and containing an outlet-flue which communicates with said generator, and a pipe for superheating steam, extending through said column between the flue and the generator, substantially as specified.

4. The combination of an annular generator, a column arranged therein, and containing a flue which communicates with said generator, and a pipe for superheating steam before its admission to said generator, extending upward and downward in said column, the column being of less thickness between the portions through which said pipe extends, so as to facilitate the heating of said pipe, substantially as specified.

5. The combination of an annular generator, a column arranged therein, and containing a flue which communicates with the generator, and also containing a number of cavities, a pipe for superheating steam before its admission to said generator, extending through or along said cavities, a pipe communicating with the superheater-pipe and extending around the annular generator, and pipes extending convergently from the pipe which extends around the annular generator to the generator

for discharging the superheated steam into the generator, substantially as specified.

5 6. The combination of a generator, a column arranged therein, and containing a flue which communicates with the upper part of the generator, a pipe for conducting naphtha, connected with the upper end of said flue to commingle naphtha-vapor with the gas, and a  
10 pipe for conducting steam to said naphtha-pipe to hasten the passage of the naphtha, substantially as specified.

7. The combination of a gas-generator, grate-bars, distributing-bars, elevated above the level of the grate-bars, and pipes for conducting su-

perheated steam under the distributing-bars, 15 so that the latter may serve to distribute it above the level of the grate-bars, substantially as specified.

8. The combination of a gas-generator, pipes for conducting steam into the lower part there- 20 of, and the perforated steam-distributing bars A<sup>4</sup>, made hollow and inclosing and protecting said steam-pipes, substantially as specified.

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Witnesses:

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