No. 835,847. PATENTED NOV. 13, 1906.

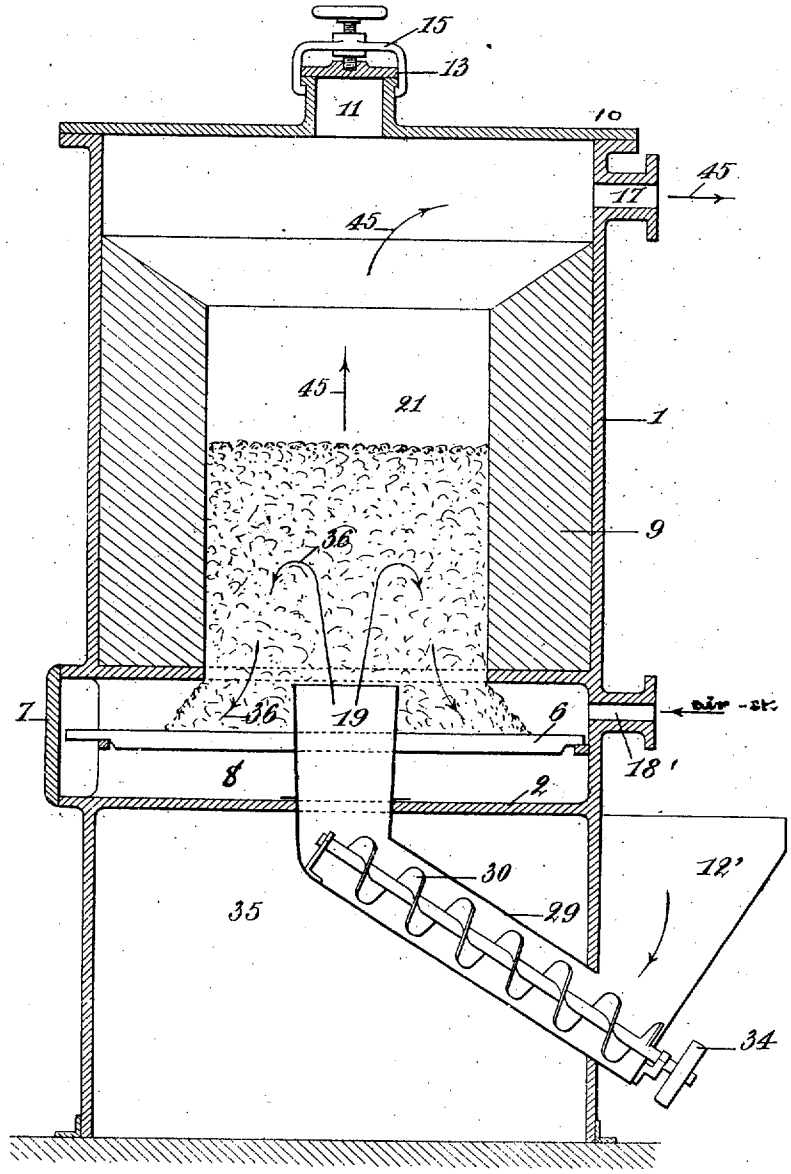
L. BOUTILLIER.

GAS PRODUCER.

APPLICATION FILED APR. 5, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Nell. Kiehle
A. W. White.

Inventor
Louis Boutillier
By Richardson
Attorneys

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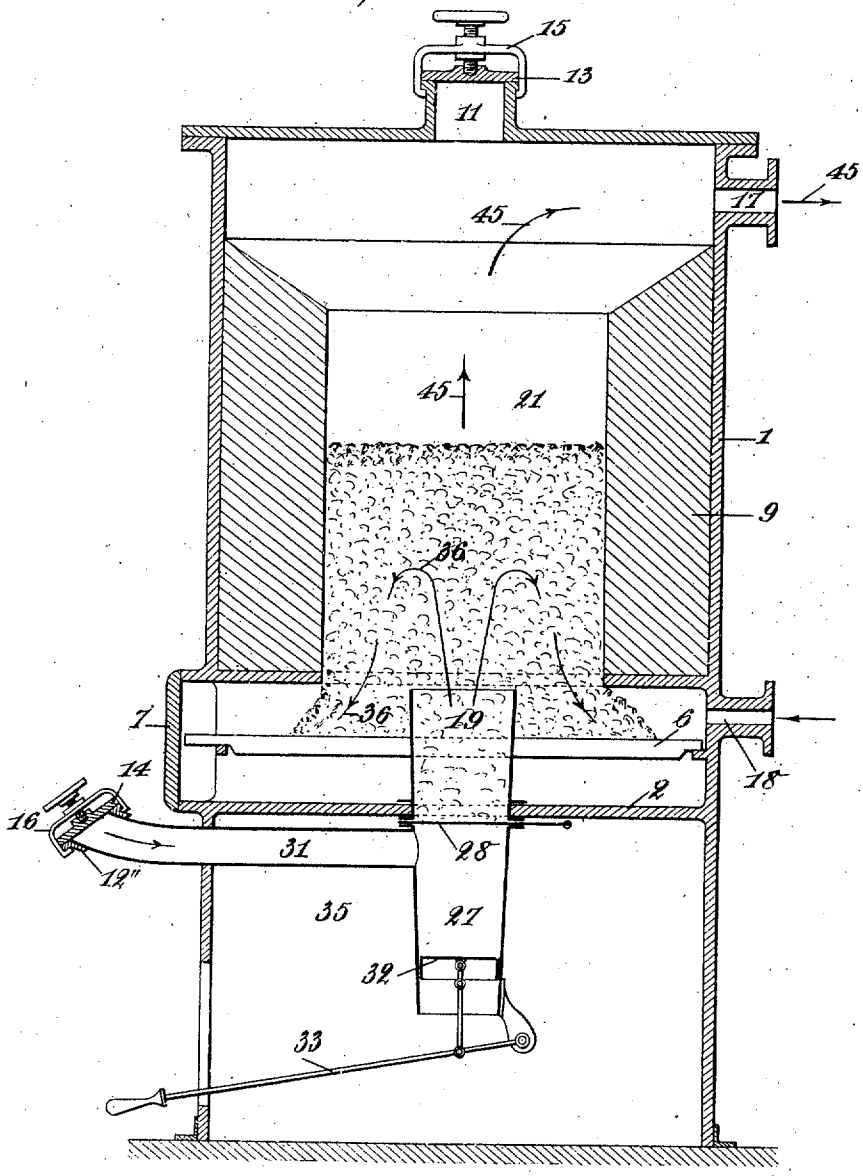
L. BOUTILLIER.

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2 SHEETS—SHEET 2.

Fig 2.



Witnesses
H. M. Kuhne
A. W. Whitte

Inventor
Louis Boutillier
By Richards & Co
Attorneys.

UNITED STATES PATENT OFFICE

LOUIS BOUTILLIER, OF PARIS, FRANCE.

GAS-PRODUCER.

No. 835,847. Specification of Letters Patent. Patented Nov. 13, 1906.

Application filed April 5, 1904. Serial No. 201,693.

To all whom it may concern:

Be it known that I, LOUIS BOUTILLIER, a citizen of the French Republic, residing in Paris, in the said Republic, have invented certain new and useful Improvements in Gas-Producers for Poor Gas Free from Tarry Matters, (for which I have obtained a patent in France, No. 331,014, bearing date April 7, 1903, to which patents of additions, respectively numbered 2,122, 2,192, and 2,351, and bearing date August 14, 1903, August 25, 1903, October 30, 1903, have been adjoined,) of which the following is a specification.

This invention relates to improved gas-producers for poor gas free from tarry matters intended more particularly for gas-engines, and has for its object to provide an improved apparatus enabling poor gas to be obtained perfectly freed from tarry matters, while using any combustible containing volatile tarry products.

My improved apparatus includes a vertical retort directly heated by the furnace and adapted to receive at its lower extremity and through suitable mechanical means the raw combustible to be used for feeding the apparatus. The said retort is established in the center of the furnace; but it is limited to the neighborhood of the grate of the latter, a little above the said grate, and it communicates with the chamber proper only at this level in order to force the tarry vapors arising from the distillation effected in the said retort to first pass through a layer or bed of incandescent combustible lying on the grate and then through a second layer or bed of combustible free from tarry products and brought to a very high temperature, said second layer covering the aforesaid first layer.

The vapors arising from the distillation of the raw combustible are thus completely free from tarry products and coöperate to the production of the poor gas in the chamber of the producer. An upper pipe established at a suitable point of the apparatus insures the drawing out of the poor gas thus manufactured, which is then conveyed to the gas engine or motor in such a state of purity as to avoid any fouling of the parts of the latter. The raw combustible fed into the retort is thus freed from the tarry products that it contains by distilling these products during the passage through the retort, and the furnace proper located around said retort is automatically fed with said distilled combustible through the mechanical means above specified. A suitable mixture of air and steam is introduced in the chamber proper of the furnace as ordinarily used in the gazogenes of this kind in order to insure the combustion and the production of a poor gas perfectly free from tarry products.

In the drawings, Figure 1 is a sectional elevation of the apparatus forming the subject of the present invention. Fig. 2 is a sectional elevation of an apparatus similar to that shown in Fig. 1, but provided with other means for feeding the retort.

Referring to the accompanying drawings, it will be seen that the improved apparatus is composed of a metallic casing 1, having a bottom plate 2, which is established below a grate 6, and a door 7 for the cleaning of the ash-pan 8. The furnace proper is provided with a cylindrical lining 9, of fire-clay, which extends up to the upper part of the furnace. The summit of said furnace is covered by a tight cover 10, having a hopper 11, adapted to be closed hermetically by a cap 13, pressed down by suitable screw-yoke 15.

The metallic casing has a pipe 17, through which the gas escapes from the producer to be conveyed to the motor or gas engine which is to be fed, and a pipe 18, situated near the grate 6, serves for introducing the mixture of air and steam into the furnace in the manner used with the ordinary gazogenes.

In the center of the apparatus is established the essential element of the apparatus, the said element consisting of a cylindrical vertical retort 19 forming the distilling-retort above specified. The said retort is limited to the neighborhood of the grate 6, a little above the latter, and it is fed with raw combustible at its lower end. This underfeeding may be effected in any suitable manner, and in the figures of the drawings two forms of devices adapted for this purpose are shown, according as a continuous or an intermittent feeding is desired. In the case of a continuous feeding the lower part of the retort 19 is connected with the charging-hopper 12′ through a suitable pipe 29, containing a screw 30, operated in any suitable manner, as for example, by means of pulley 34. In the case of an intermittent feeding the lower part of the retort 19 is provided with a prolongation constituted by a cylinder 27, which communicates with a pipe 31, the free end 12″ of which is closed hermetically by means

of a cap 14, maintained in position by suitable device 16. The pipe 31 serves for introducing into the retort 19 the raw combustible which is to be distilled. The lower part of the cylinder 27 is provided with a piston 32, operated from the outside in any suitable manner, as for example, by means of a lever 33, pushing the combustible introduced through the pipe 31 into the cylinder 27 and into the retort 19. In this case the bottom of the retort 19 will preferably be provided with a damper 28 or the like suitably actuated from the outside.

The working of the apparatus is as follows: The furnace is first lighted by introducing a combustible freed from tarry products through the hopper 11, which is then closed by the cap 13. The admission of the mixture of air and steam through the pipe 18 maintains the combustion. The retort 19 is filled with raw combustible which is to be distilled, and before the gas is collected by the pipe 17 it is necessary to wait until the temperature has become sufficiently high to produce the complete distillation of all the tarry matters contained in the said combustible. When this temperature is reached, the apparatus is able to normally operate, and this operation is effected as follows: The combustible introduced into the retort 19 by one of the two means above specified is there distilled under the action of the heat which the retort 19 receives from the very hot region in which it is located, and as it discharges a little beneath the layer of incandescent combustible contained in the furnace the vapors arising from the distillation effected in this retort are forced to pass through this incandescent layer and through the amount of combustible free from tarry products and brought to a very high temperature which covers the aforesaid layer. The said tarry vapors are thus completely reduced, as above specified, before their entrance into the chamber 21 of the gazogene. The combustible which has been distilled during its passage through the retort 19 descends then of itself into the furnace, being pushed out by the fresh combustible introduced into the lower part of the retort 19, as hereinbefore explained. Such combustible then follows the course indicated by the arrows 36 inside the furnace, and it is there completely burned. The working of the apparatus is the same in the case of the apparatus shown in Figs. 1 and 2, and the purified poor gas is discharged through pipe 17, following the course indicated by the arrows 45.

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

A gas-producer consisting of a furnace having a flat grate and an inlet for air and steam adjacent said grate and an outlet in the upper part of the furnace for the gas, a vertical retort in the center of the furnace extending upwardly through the bottom thereof and having its upper end a little above the grate and means for forcing the raw combustible up through the retort to the furnace.

In witness whereof I have hereunto set my hand in presence of two witnesses.

LOUIS BOUTILLIER.

Witnesses:
HANSON C. COXE,
JULES FAYOLLET.