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P. EYERMANN.

GAS PRODUCER.

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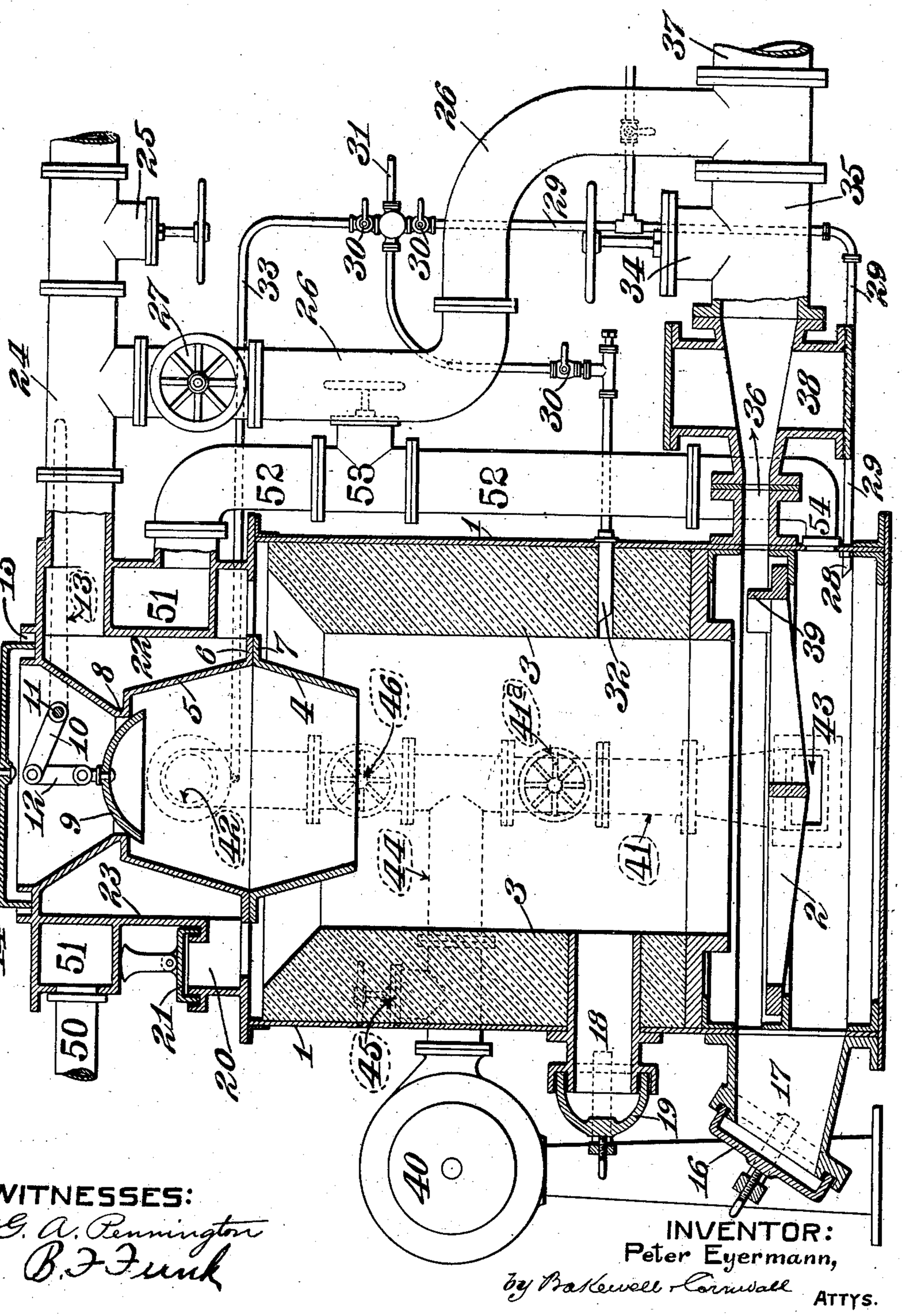

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GAS-PRODUCER.

No. 840,447. Specification of Letters Patent. Patented Jan. 1, 1907.

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To all whom it may concern:

Be it known that I, PETER EYERMANN, a citizen of the United States, residing at Dubois, county of Clearfield, Pennsylvania, have invented a certain new and useful Improvement in Gas-Producers for Various Fuels, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

The figure in the drawing is a view, partly in elevation and partly in section, of a gas-producer constructed in accordance with my invention.

This invention relates to gas-producers; and one of the objects is to provide a gas-producer which may be utilized for generating gas from anthracite or bituminous coal.

Another object of the invention is to provide a gas-producer which may utilize the bituminous or anthracite products to the best advantage, so as to produce gas of excellent quality.

Other objects and advantages, as well as the novel details of construction of this invention, will be specifically referred to hereinafter, it being understood that changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

Referring now to the drawings illustrating the preferred embodiment of my invention, 1 designates the shell of the producer, provided in the lower end with grate-bars of any suitable construction, which grate-bars are designated by the reference-numeral 2. The interior of the shell is provided with a fire-brick lining 3.

4 is a cone-shaped magazine for the fuel, which is located at the upper end of the shell, said magazine being connected to and in communication with a hopper 5, which is provided with an outstanding flange 6, which rests on the top of the covering surrounding the lining 3. The magazine 4 is also provided with an outstanding flange 7, which is connected to the flange 6 in any suitable manner. The hopper 5 is provided with a constricted portion 8 intermediate its ends, the top portion of the hopper being flared outwardly to form a receptacle for the initial reception of the fuel. The constricted portion 8 surrounding the opening in the hopper may be closed by a concavo-convex valve 9, so that the hopper 5 is provided with an upper compartment and a subjacent compartment divided by the valve 9. The said valve 9 is supported by a crank-arm 10 on a shaft 11 and connected to the valve by the link 12. This shaft 11 projects through the wall of the hopper, and on its exterior end is an operating-lever 13, so that the position of the valve may be controlled through the medium of said lever. The top compartment of the fuel-hopper may be closed by a cover 14, which is provided with a depending flange for insertion in the groove 15 in the top of the producer. If non-bituminous fuels are used, the valve 9 may be closed when the cover 14 is opened; but this will not generally be the case when the bituminous fuels are utilized.

A suitable door or closure 16 is utilized for closing an opening 17 in communication with the ash-pit, said opening being surrounded by a suitable casing through which the ashes may be removed. It is to be understood that the ash-pit may be of suitable size to receive the products of combustion resulting from the operation of the producer.

18 designates a tube which is secured in the side wall of the producer and which is in communication with the interior of the producer and the outside atmosphere when not closed by the cover 19. There may be one or more openings similar to the one just described, and these openings will permit the agitation of the fuel by means of a suitable agitator or poker. If tarry or bituminous fuels are used, the cover 19 may be removed for the entrance of air. If the producer is to be operated on the pressure-gas producer principle, a pressure-supplying tube or pipe may be attached to the tubes 18 and 44 by any suitable means. Poking and air holes 20 are provided also on the top of the producer and are normally closed by covers 21. Around the coal-magazine is a space 22, formed by the hopper 5 and the outer casing 23. This space is in communication with a pipe 24, having a valve 25 therein. This pipe is designed for the purpose of carrying off the gases from the producer. A pipe 26 is in communication with the pipe 24, which pipe 26 may be closed or opened by the valve 27. When anthracitous fuel is employed, the pipes 24 or 26 will be connected to the vaporizers, scrubbers, &c., commonly employed in this class of generators.

28 designates a nozzle having a tube 29 in communication therewith, said tube 29 being provided with a valve 30. This tube 29 is adapted to receive steam or water from a supply-pipe 31. If water is injected, it will be vaporized inside of the fuel-bed, thus avoiding the necessity of a vaporizer. A nozzle 32 is also in communication with the interior of the producer at its middle portion, while a similar nozzle leading from a tube 33 is in communication with the producer at its upper end, all of said tubes being controllable by valves 30, similar to the one designated in the tube 29.

If bituminous fuels are used, the valve 9 and the lower or subjacent chamber of the hopper 5 may be dispensed with, and where the producer is to be built expressly for bituminous fuel these devices may not form a part of the machine at all.

During the starting of the producer the openings 17 and 18 should be closed. Then the valve 25 may be opened and the valve 27 closed. After the gas begins to be utilized the cover 19 may be opened and a valve 34 in the tube 35 may be opened and the gas will escape through the lower end by means of the port 36, and said gas will pass to the source of consumption through the supply-pipe 37 in communication with said port 36. If the device is used as an updraft-producer, however, the valve 34 will be closed and the gas will escape through the pipe 24, the valve 27, and the pipe 26 to the pipe 37 and to the source of consumption. Attention is also directed to the fact that the device is intended to be used with anthracite fuels, in which case the device may be used as a downdraft-producer, if special circumstances may require, or the device may be utilized as an updraft-producer while utilizing bituminous fuels, if such bituminous fuels are of such composition as to permit of the latter operation. Attention is also directed to the fact that the grate may be entirely dispensed with, and the fuel may rest in the lower portion of the producer on its own ashes and cinders.

In the path of pipe 36 is a dust collector or receptacle 38, which may have a suitable form to remove the dust from the gas as it passes from the producer to the source of consumption.

39 designates a baffle or separating wall arranged in the lower portion of the casing to avoid the direct escape of the gas and ashes to the dust-collector 38. By providing this wall the gas will be permitted to escape without taking with it the ashes or other solids forming the products of combustion.

Attention is directed to the fact that by utilizing a producer constructed in accordance with the one heretofore described it is possible to run the producer in such a way that fuels may be charged until it is filled. After this first process the downdraft may be changed to an updraft, if desired, and the gas from this fuels may be taken from the top. This reversal of the device so as to change it from an updraft to a downdraft, and vice versa, may be easily accomplished by controlling the valves of the producer.

40 designates a fan-blower of any suitable construction, which is in communication with a pipe 41, connected to the top and bottom of the producer through the openings 42 and 43, respectively. The pipe 41 is connected intermediate its ends to the blower 40 by a branch pipe 44 and a valve 41ª. In this branch pipe 44 is a valve 45, and in the pipe 41, above the branch 44, is also a valve 46. By opening the valves 45 and 41ª and closing the valve 46 communication may be had between the blower 40 and the lower portion of the producer only. If the valve 46 is opened and 41ª closed, communication will be had between the blower and the upper portion of the producer. The valve 46 will be opened to provide a downdraft and the valve 41ª may be opened to provide an updraft for the gas. This producer is equipped on the top with a pipe connection 50, entering the casing 51, which surrounds the upper fuel and gas-casing 23. A pipe 52 is in communication with the space 51 and with the lower end of the producer at 54, and a valve 53 may be used for controlling said flue or pipe 52. This arrangement serves for warming the cold air by means of hot escaping gases when the producer is used as an updraft-producer. If the device is used as a downdraft-producer, the gas may be drawn through this pipe 52, and if it is desired to use heated air in the downdraft-producer this air may enter through the casing and the space 22 in the top of the fuel-bed, and it will thus be heated by the gas in the space 51.

From the foregoing it will be apparent that this producer is adapted for use with all kinds of fuels, and in order to accommodate it to the different types of fuel it will only be necessary to manipulate the valves in the several pipes, so as to effect the desired drafts.

I am aware that changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A gas-producer comprising a body portion provided with a fire-brick lining and having grate-bars at its lower end, a metallic casing mounted on the upper end of said body portion, a fuel-receiving hopper arranged inside of said casing and spaced away from the walls thereof, a gas-conducting pipe leading from the space surrounding said hopper, and steam or water supplying nozzles entering

the body portion of the producer at its upper end, at its central portion and at its lower end beneath the grate-bars; substantially as described.

2. A gas-producer comprising a casing, means for producing a downdraft in said casing, a pipe entering the lower end of said casing for conveying away the gas, a receptacle depending from said pipe at a point outside of the casing, and a baffle 39 arranged inside of the casing and projecting into the path of the gas as it escapes from the casing; substantially as described.

3. A gas-producer comprising a body portion having a casing 23 mounted on its upper end, a fuel-charging device arranged inside of said casing and spaced away from the interior thereof, a wall surrounding the casing 23 to provide a chamber 51, a pipe 50 entering said chamber, and a pipe 52 connecting said chamber with the lower end of the body portion of the producer; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 14th day of August, 1905.

PETER EYERMANN.

Witnesses:
E. P. HANSON,
E. V. TODD.