

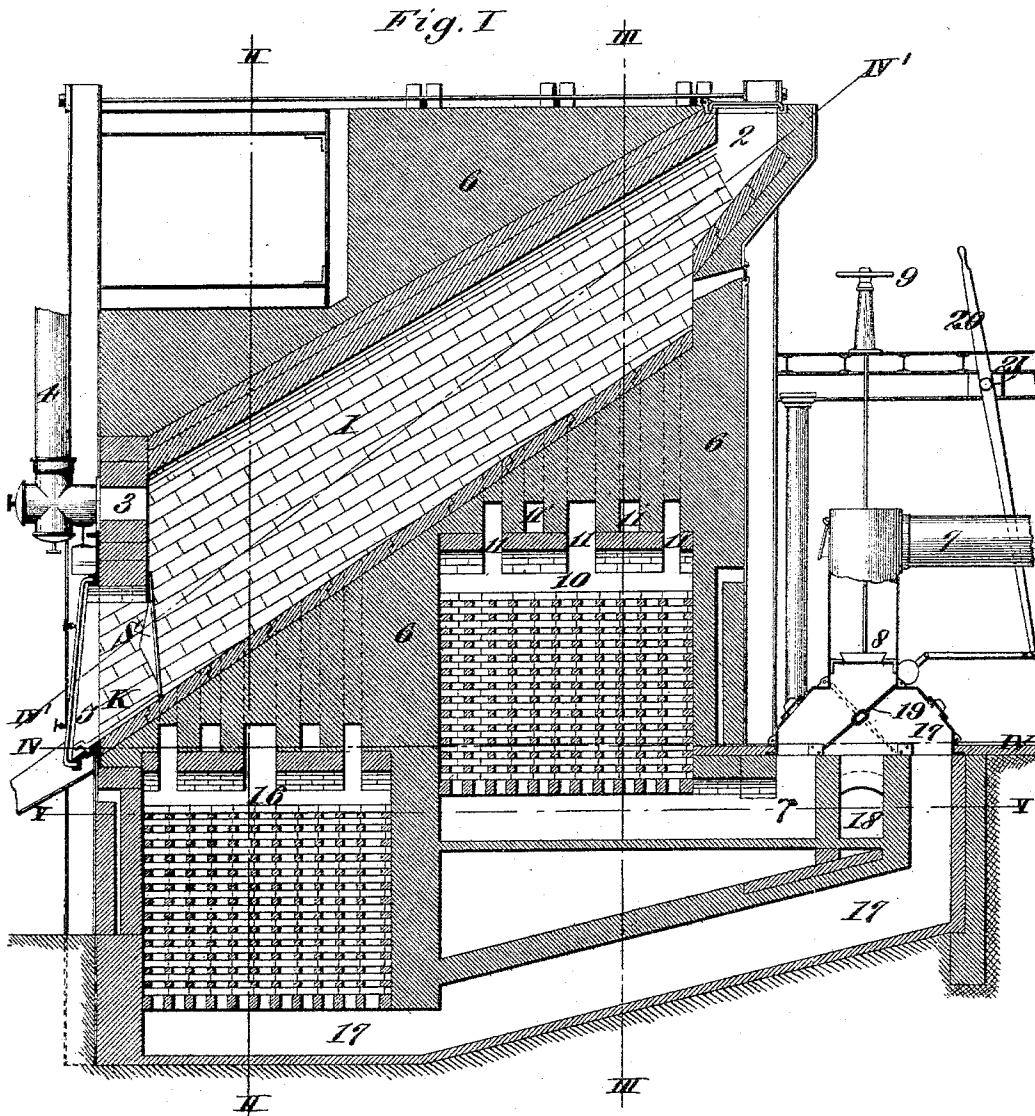
(No Model.)

3 Sheets—Sheet 1.

J. C. DODS.
GAS GENERATOR.

No. 571,558.

Patented Nov. 17, 1896.



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E. S. Knight
Stanley Stoners.

Inventor.
John C. Dods.
By Knight Bros.
attys

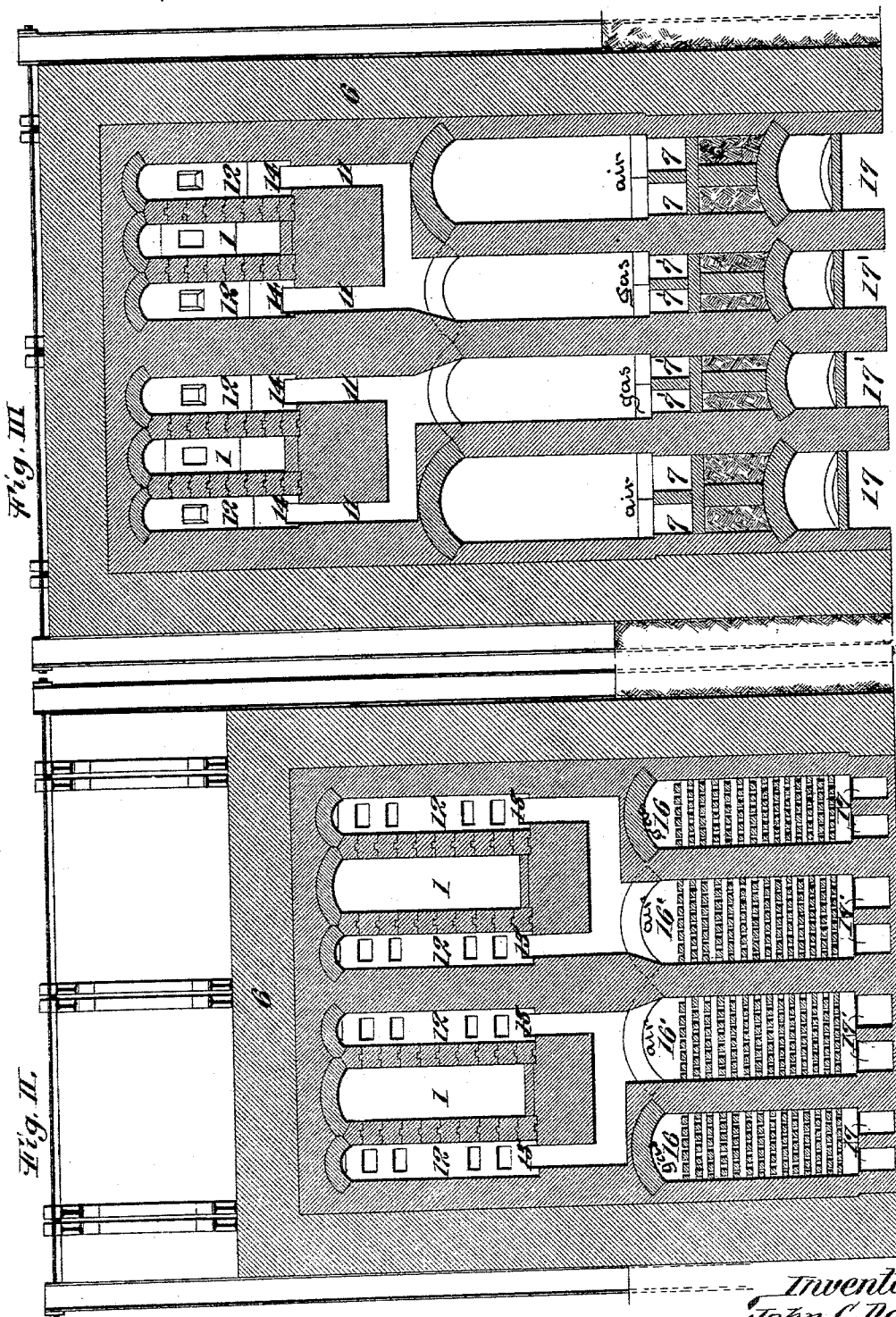
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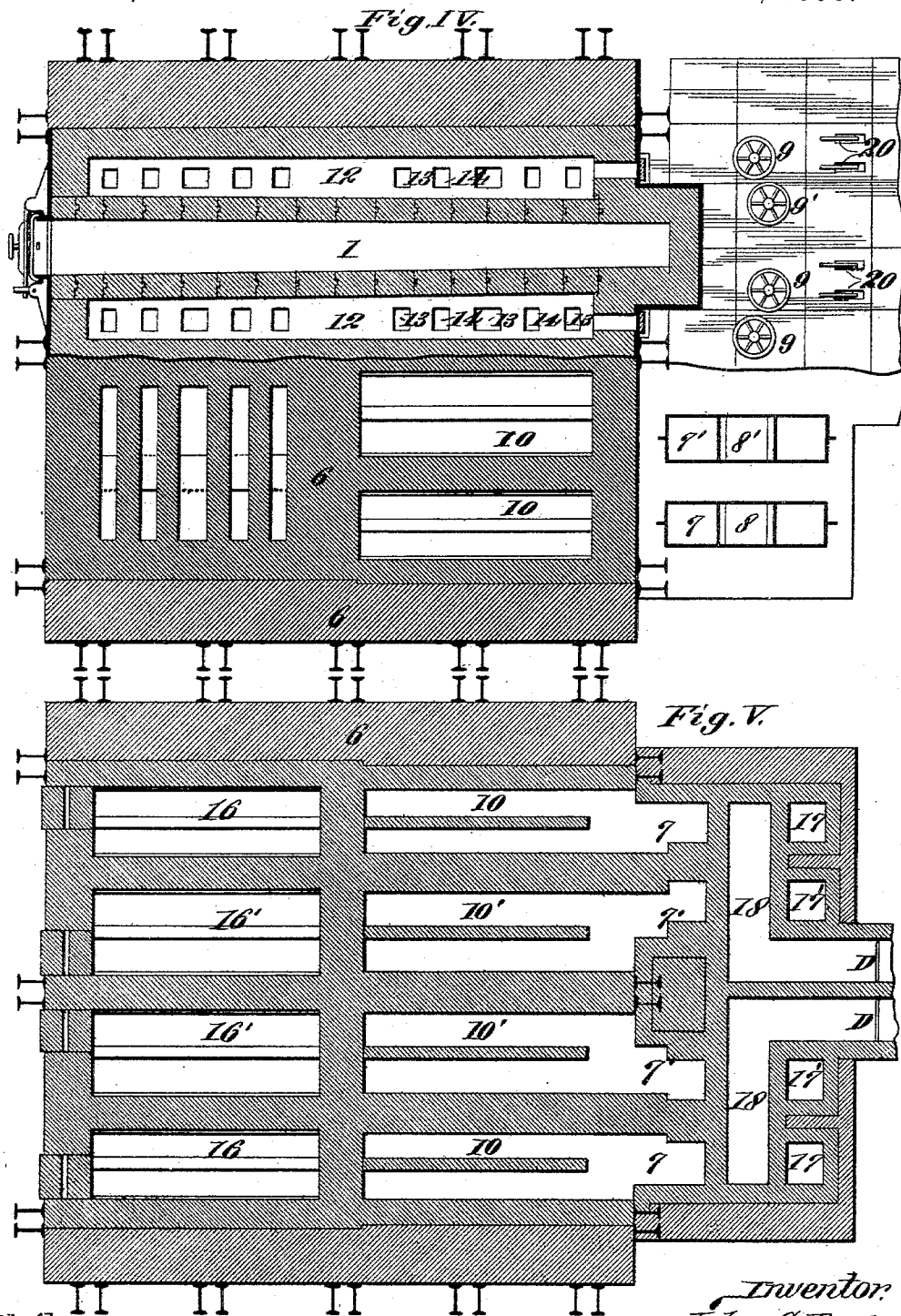
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UNITED STATES PATENT OFFICE.

JOHN C. DODS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO JAMES GREEN, OF
SAME PLACE.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 571,558, dated November 17, 1896.

Application filed July 3, 1896. Serial No. 598,010. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. DODS, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Illuminating-Gas Generators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to provide a construction of a single inclined retort which may be used individually or in series, each retort being similar to a coke-oven and being heated by a distinct regenerative gas-furnace using producer-gas, whereby a much larger amount of coal can be charged and converted into illuminating-gas in a single retort than can be done in a bench or series of ordinary retorts covering the same amount of floor area. My device also accomplishes the evolution of a maximum amount of gas from a minimum amount of heat and labor.

I accomplish the objects of my invention by means of the construction illustrated in the accompanying drawings, in which—

Figure I shows a vertical section through the passages of the retorts from the front to the rear of my improved illuminating-gas generator. Fig. II shows a vertical transverse section taken along the line II II, Fig. I. Fig. III shows a vertical transverse section taken along the line III III, Fig. I. Fig. IV shows a section, partly horizontal and partly oblique, taken along the lines IV IV and IV' IV', Fig. I. Fig. V shows a horizontal section taken along the line V V, Fig. I, with the checker-work shown in said Fig. I removed.

1 is the retort into which the coal is poured from which the illuminating-gas is to be obtained.

2 is the door through which said coal is introduced.

3 is the entrance into the pipe 4, leading to the main for the purpose of carrying off the evolved gas. The said retort 1 is built so that the roof thereof will conform to the angle of the slope of the coal, so that when the coal is run into the retort the top surface of the coal will be equally distant from the arch of the roof of the retort, leaving a passage between

them for the evolved gas along the entire length of the retort. The floor of the retort is built at a steeper angle than the top, so that the coal will run freely out of the exit-door 5 upon disengaging the key K, which holds the shield S, which guards the exit from the retort.

6 is the masonry in which the retort is supported. 7 is a passage through which producer-gas for heating the retort and its contents is introduced, and 8 is a valve operated by a hand-screw 9 for regulating the amount of the gas introduced from the pipe 7.

10 is a space filled with checker-work composed of brick or tiles, through which the producer-gas passes before it reaches the forked passages located beneath the retort 1.

The retort 1 is built of fire-clay blocks or fire-bricks. It is flared at the sides, being wider in the front than in the rear to avoid side friction and binding of the coal when introduced or the coke which is discharged. Each retort is designed to carry some three or more tons of coal.

The combustion-chambers 12 12 are placed one on each side of the retort 1. They extend the length of the retort and are of the same height as the said retort and have arches on the same level and at the same angle as the retort. These combustion-chambers are open from end to end and are provided with no flues. They are kept full of burning gas introduced as described.

A second set of forked passages for the introduction of air, operated in the same manner as the passages for the introduction of gas already described, is built alongside the set for the introduction of gas and is marked with corresponding numerals bearing prime-marks. The two sets have their passages alternating and introduce the gas and air for combustion at the sides of the retort in the chambers 12, the air entering said chambers through the openings 13 and the gas through the passages 14, Fig. IV.

D is a damper by the closing of which the whole furnace is put under compression and the combustion-chamber 12 filled with burning gas. The heat in the combustion-chambers 12 is communicated through the side walls of the retort to the coal in the retort

for the purpose of evolving the gas therefrom. Under each retort and upon which it is carried is a distinct regenerative gas-furnace to supply the heat separately and individually to said retort. The furnace is of the well-known Siemens type, consisting of a gas-chamber 10 and an air-chamber 10' in the rear of the bench and a gas-chamber 16 and an air-chamber 16' in front of the bench likewise filled with the checker-work. The producer-gas, as described, enters through the pipe 7, passing through the regulating-valve 8, enters at the bottom of the regenerative chamber 10, passes up through the heated checker-work and through the forked passages 11 11 to the passages or ports 14 14 into the combustion-chambers 12 12 of each side of the retort 1. The air enters through the regulating-valve 8' and enters the chamber 10' at the bottom thereof and passes up through the heated checker-work and through the forked passages 11' 11' to the ports in the combustion-chambers 12 12. At the outlet of these five double ports in the combustion-chambers 12 the gas and air unite and burn, and the burning gas passes the length of the combustion-chambers, then down through the openings and forked passages into the chambers 16 16', where the heat is absorbed by the checker-work therein, and the burned gas passes through the flues 17 17', located beneath the furnaces, back to the valves 8 8', uniting in the outlet-flue 18 and passing the damper D to the smoke-stack.

19 is a reversing-valve which changes the direction of the air and gas currents, operated by a lever-arm 20, pivoted at 21, said valve 19 being used for the purpose of directing gas into either the pipe 7 or the pipe 17. On shifting the valve 19 at regular intervals the direction is changed, so that the burning gases pass alternately from rear to front and from front to rear along the whole length of the combustion-chambers 12 on each side of the retort.

I place the rear gas and air chambers 10 10' at a higher elevation than the front chambers 16 16' in order to bring the openings of the rear chambers as near to the combustion-chambers as those in front, and for the further purpose of providing room below the rear regenerator-chambers for the flues to pass under them to the front chambers.

By the device which I have described the coal is poured into the retort at its upper end 2, distributing itself along the retort at an angle, said angle being so oblique that when the lower door 5 is opened and the key K removed the coke forces out the shield S and runs out of itself, thus avoiding the labor of raking out the retort. The roof of the retort follows the angle and slope of the coal, so

that the gas-space above the coal will be uniform along the retort.

I am aware that coal has been charged and coke discharged in benches of inclined retorts, but in the former constructions the lower doors would have to be opened and closed and the coal charged and the coke discharged from twelve to fifteen times as often to accomplish the same results as the construction which I have provided. By the construction described I can also more properly regulate the degree of heat to be given to the retort than can be done in either a bench of gas-retorts or in a system of coke-ovens. I use a low heat at the beginning of the charge, and obtain an illuminating-gas rich in high carbids and of a high candle-power by not allowing the heat to rise high enough to decompose the gas. If the temperature is allowed to become too high, carbon will be deposited upon the walls of the retort. When these rich gases have passed off to the main, I can then increase the heat by turning on more producer-gas and air through the regenerators and finish the operation at an intense heat, so as to thoroughly decompose the coal, and thereby obtain not only all of the gas which can be yielded from the coal used, but I also get a coke that will not stick to the sides of the retort and which will run out freely when the lower door thereof is opened.

The discharge end of the retort is provided with a door 5 and a key K, which secures a shield S. This construction keeps the hot coke away from the door, leaving an air-space between the shield and said door. When the retort is to be emptied, the door 5 is opened, the key K released, and the coke, by reason of the funnel-shaped retort, runs out, bringing the shield S with it.

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

An illuminating-gas generator comprising a retort, the combustion-chambers extending alongside the retort, the elevated regenerative furnace located beneath the upper end of the retort, the depressed regenerative furnace located beneath the lower end of the retort, the alternating gas and air forked passages connecting the regenerative furnaces with the combustion-chambers, the upper producer-gas and air passages connected with the elevated regenerative furnace, the lower producer-gas and air passages extending beneath the regenerative furnaces and connected with the depressed regenerative furnace and the reversing-valve controlling the upper and lower passages, substantially as described.

JOHN C. DODS.

In presence of—

E. S. KNIGHT,
STANLEY STONER.