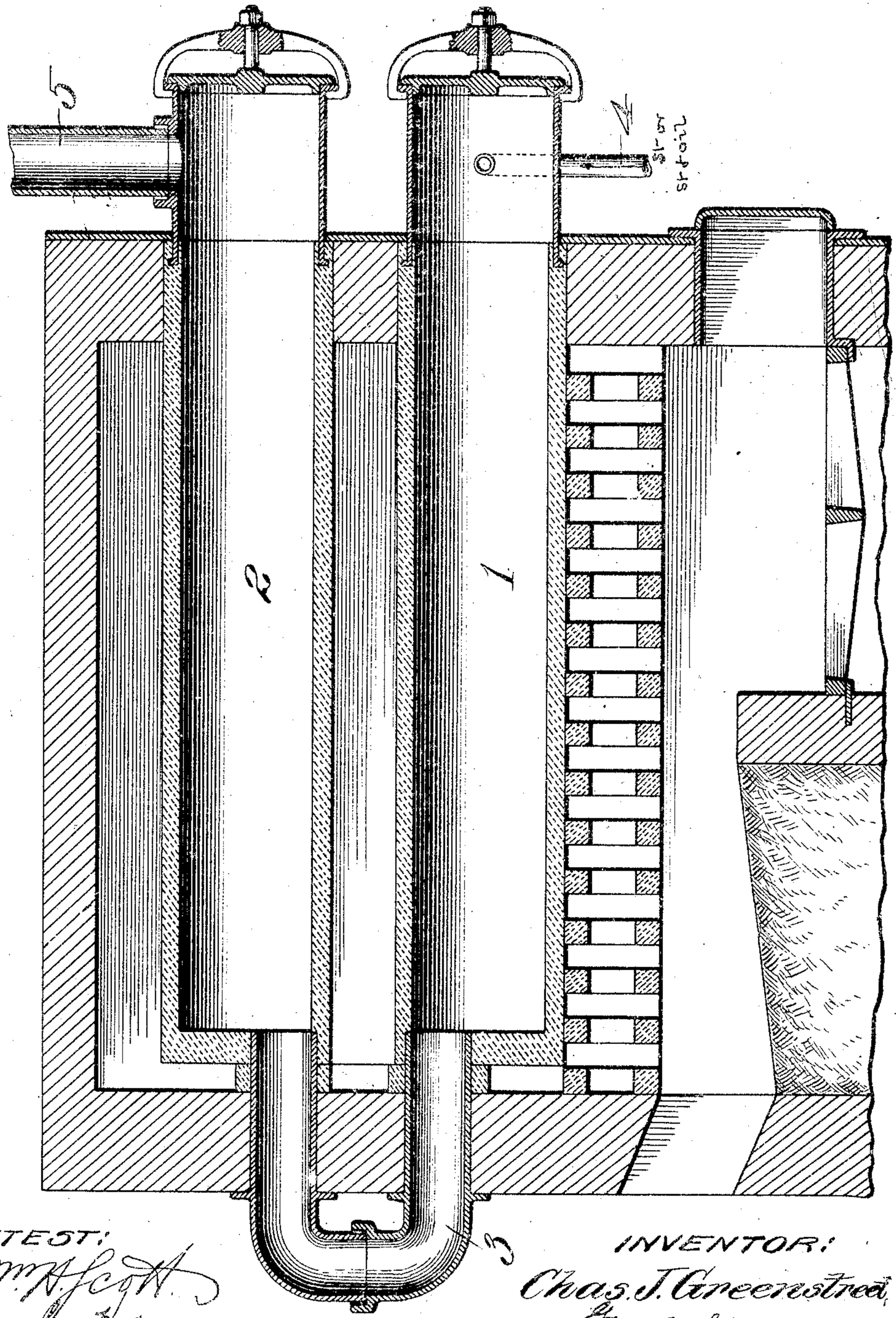
C. J. GREENSTREET.

PROCESS OF PRODUCING GAS.

APPLICATION FILED FEB. 28, 1903.

906,793. Patented Dec. 15, 1908



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UNITED STATES PATENT OFFICE.

CHARLES J. GREENSTREET, OF ALTON, ILLINOIS.

PROCESS OF PRODUCING GAS.

No. 906,793. Specification of Letters Patent. Patented Dec. 15, 1908.

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To all whom it may concern:

Be it known that I, CHARLES J. GREENSTREET, a citizen of the United States of America, residing in Alton, in the county of Madison and State of Illinois, have invented certain new and useful Improvements in Processes of Producing Gas, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

In the burning of limestone for the commercial production of quicklime there is evolved, as is well known, an incombustible carbon dioxid gas and it has been customary heretofore to permit such gas to escape to the atmosphere without making any use thereof.

My invention relates to a method whereby such heretofore considered worthless carbon dioxid gas, as far as fuel, light and power purposes are concerned, may be utilized in producing a most valuable combination of gases for light, heat and power purposes.

In carrying out my method I place the limestone in a retort of any common description, such as those at present in use in gas works, and, by subjecting the retort to heat, bring the limestone to a proper heat and inject into the retort steam or super-heated steam. The gases arising from the limestone are then permitted to pass through carbonaceous matter heated to a proper heat, thus forming methane, ethane, carbon monoxid and hydrogen, in varying proportions, dependent upon the degree of heat in the gases while passing through the heated carbonaceous matter, the temperature of the carbonaceous matter and the rapidity with which the operation is conducted.

To provide for increase in the heating and illuminating quality of the gas produced in following my method, I may introduce into the retort containing the limestone and with the steam injected into said retort, a quantity of oil, such as crude petroleum which acts, in passing over or through the heated limestone and carbonaceous matter, to break these substances up into highly combustible gases suitable for increasing the candle-power and heat units of the gas. The same result may also be accomplished by associating with the limestone a small amount of calcium carbid which will become decomposed, due to the injection of steam into the retort.

An important point to which I wish to direct attention relative to the use of steam in carrying out my process is that the steam facilitates the burning of the limestone for the reason that it breaks up the carbonate into its constituent parts, viz: free lime (calcium oxid) and carbonic acid gas at a much lower temperature and more rapidly than when heat is applied alone in the burning of limestone. This is a valuable feature in that it results in a saving of both fuel and time in the production of gas.

In carrying out my process I preferably use with the carbonaceous matter employed, such as the heavy viscous waste or residue that results from the distillation of crude petroleum in the production of the commercial products acquired therefrom, such as naphtha, gasolene and coal oils, or other carbonaceous matter, such as coal, charcoal, coke, saw-dust or peat in combination with any nonvolatile carbonate, such as calcium or magnesium or copper.

By producing gas in the manner described, I am enabled to produce the gas without greater costs than has heretofore been counted upon in the making of quicklime, there being obtained approximately fifteen thousand to twenty thousand cubic feet of gas of highest heat value per ton of limestone rock and carbonaceous material, dependent upon the qualities of the carbonaceous matters used.

The accompanying drawing is a vertical section through a furnace that may be used in carrying out my method. This furnace contains two retorts 1 and 2 that are united by a connection 3 and placed one above another.

In carrying out my method I preferably introduce the limestone or carbonate into the lower retort 1 and inject steam into said retort through a steam conducting pipe 4. The gas arising from the limestone or other carbonate passes through the connection 3 and mingles with the gas produced from the carbonaceous matter which is placed in the retort 2. The resultant gas then finds escape from the retort 2 into the conducting pipe 5 that may lead to any appurtenances usual to gas manufacturing plants.

While I prefer to place the limestone or carbonate in one retort and the carbonaceous matter in another retort, it is obvious that they might both be placed in a single retort without departing from my invention. In this connection it is to be noted that the

retorts 1 and 2 communicate with each other and that they, to all intents and purposes, serve as a single retort.

I claim:

1. The method of producing gas, which consists in introducing a mineral carbonate and a carbonaceous matter into a retort, subjecting said retort to heat, and injecting steam into said retort.

2. The method of producing gas, which consists in introducing limestone and a carbonaceous matter into a retort, subjecting said retort to heat and injecting steam into said retort.

3. The method of producing gas, which consists in introducing limestone and a carbonaceous matter into a retort, subjecting the retort to heat, injecting steam into said retort and combining with said limestone an oil or analogous substance to raise the illuminating quality and heat units of the gas.

4. The method of producing gas, which consists in introducing a mineral carbonate and the waste from the distillation of crude petroleum into a retort and subjecting said retort to heat, and injecting steam into said retort.

CHAS. J. GREENSTREET.

In presence of—
BLANCHE HOGAN,
WM. H. SCOTT.