

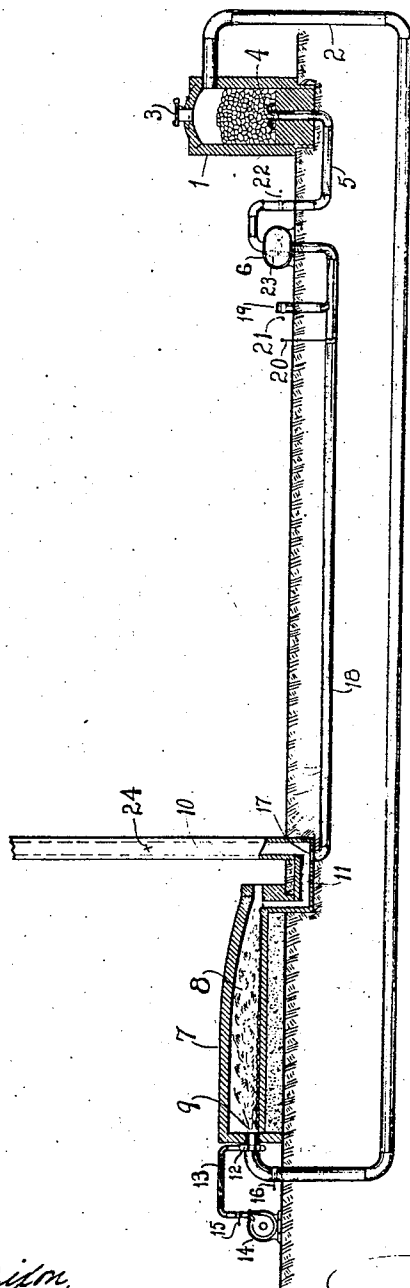
No. 821,995.

PATENTED MAY 29, 1906.

C. ELLIS.

GAS PRODUCING AND CONSUMING APPARATUS.

APPLICATION FILED MAR. 28, 1905.



WITNESSES:

Charles E. Dixon

A. M. Senior

INVENTOR

Carlton Ellis

UNITED STATES PATENT OFFICE.

CARLETON ELLIS, OF NEW YORK, N. Y., ASSIGNOR TO COMBUSTION UTILITIES COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

GAS PRODUCING AND CONSUMING APPARATUS.

No. 821,995.

Specification of Letters Patent.

Patented May 29, 1906.

Application filed March 28, 1905. Serial No. 252,487.

To all whom it may concern:

Be it known that I, CARLETON ELLIS, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Gas-Producing and Consuming Apparatus, of which the following is a specification.

This invention relates to apparatus for making producer-gas, in which products of combustion are drawn in a highly-heated condition from a furnace or other source, are introduced into a gas-producer remote from the furnace, and are passed through a deep bed of fuel in order to produce combustible or producer gas.

It is the object of this invention to make use of the sensible heat of a portion of the products of combustion from a furnace by converting this sensible heat in so far as possible into the potential heat or energy of combustible gas.

My apparatus makes use as a fuel of coal which is low in earthy constituents, particularly of easily-fusible mineral matter, such as pyrite and the like.

An essential feature of my invention is the means provided to effect control of the temperature of the gas-producing mass, for by this means a proportioning of the endothermic and exothermic constituents of the draft-current is readily secured which preserves the equilibrium of reaction necessary for satisfactory and continuous operation.

In the accompanying diagrammatic drawing I show a form of apparatus which is suitable for the purpose aforesaid.

In the drawing, 1 is a gas-producer adapted to contain a deep bed of fuel.

2 is an outlet-pipe for the combustible gas. 3 is a hopper or feed-aperture for the introduction of fuel.

4 represents the tuyers, through which enters the blast for supporting combustion and effecting gasification of the fuel.

5 is a pipe or passage connecting the tuyers 4 with a mechanical blower or blast appliance 6.

7 is a furnace, shown of the reverberatory type, having the hearth 8 and gas and air port 9. A stack 10 is connected to this furnace by the flue 11.

12 represents a series of air-inlets connect-

ed to a bustle-pipe having connection with the pipe 13, which in turn is connected with the fan-blower 14. A damper 15, placed in this pipe, serves to regulate the flow of air.

A damper 16 is placed in the pipe or passage 2 to regulate the flow of gas from the gas-producer 1.

In the stack-flue 11 is an outlet 17, from which extends the passage 18 to the fan 6. An air-inlet 19 is placed on the inlet side of the fan 6.

20 is a damper or valve to regulate the amount of products of combustion handled by the fan 6.

21 is a damper regulating the fresh-air supply.

22 is a damper regulating the volume of the blast supplied to the producer.

The fan 6 is shown with the impeller-wheel 23. It is therefore of the positive blower type. These impeller-wheels may be water-cooled. A fan-blower or mechanical draft appliance of any other type may be employed.

My method of operation is as follows: A bed of ignited coal is brought to such a depth in the gas-producer that upon the blowing therethrough a blast containing oxygen and carbon dioxid a nearly complete reduction to carbon monoxid is obtained. The fan 6 is put in operation to produce the necessary blast. The combustible gases so generated are carried through the passage 2 to the furnace 7. Air is admitted through the passage 13, and combustion of the gas takes place over the hearth 8. A portion of the products of combustion are withdrawn through the pipe 18 and enter the producer. The dampers 20 and 21 are carefully adjusted to secure a combustible gas of the desired quality. In some cases damper 21 may be completely closed. If the gases of the furnace enter the producer at a temperature higher than that at which they depart, it is evident that a portion of their sensible heat has been converted into potential heat in the form of combustible gas. This condition I seek to secure, inasmuch as great economy in fuel results from operating in such a manner.

In the drawing the passages from furnace to producer are shown under ground. I do not limit myself to this arrangement of apparatus—as, for instance, the passages may be

carried above the ground and be suitably insulated to guard against loss of heat.

What I claim is—

1. In a gas producing and consuming apparatus, the combination of a gas-producer adapted to contain a deep bed of fuel, a gas-consuming metallurgical furnace, a heat-insulated pipe connection delivering gas from the producer to the furnace, a heat-insulated pipe connection abstracting burned gases from the furnace and delivering them beneath said fuel, and means for admixing air with the gases in said latter heat-insulated pipe connection prior to the delivery to the producer.
2. In a gas producing and consuming apparatus, the combination of a gas-producer adapted to contain a deep bed of fuel, a gas-consuming metallurgical furnace, a pipe connection delivering gas from the producer to the furnace, a heat-insulated pipe connection abstracting burned gases from the furnace and delivering them beneath said fuel, a power-driven admixing and propelling device in said heat-insulated pipe connection and a valve-controlled inlet-opening to the atmosphere in the pipe connection on the suction side of said device, whereby the burned gases and cold air will be admixed in regulated proportions.
3. In a gas producing and consuming apparatus, the combination of a gas-producer adapted to contain a deep bed of fuel, a gas-consuming metallurgical furnace, a heat-insulated pipe connection delivering gas from the producer to the furnace, a heated insulated pipe connection abstracting burned gases from the furnace and delivering them beneath said fuel, a power-driven mixing and propelling device in said latter heat-insulated pipe connection, and a valve-controlled inlet-opening to the atmosphere in the pipe con-

nection on the suction side of said device, whereby the burned gases and cold air will be admixed in regulated proportions.

4. In a gas producing and consuming apparatus, the combination of a gas-producer adapted to contain a deep bed of fuel, a gas-consuming metallurgical furnace, a pipe connection delivering gas from the producer to the furnace, an underground pipe connection abstracting burned gases from the furnace and delivering them beneath said fuel, and means for admixing air with the gases in said underground pipe.

5. In a gas producing and consuming apparatus, the combination of a gas-producer adapted to contain a deep bed of fuel, a gas-consuming metallurgical furnace, an underground pipe connection delivering gas from the producer to the furnace, an underground pipe connection abstracting burned gases from the furnace and delivering them beneath said fuel, and means for admixing air with the gases in said underground pipe.

6. In a gas producing and consuming apparatus, the combination of a gas-producer adapted to contain a deep bed of fuel, a gas-consuming metallurgical furnace, a pipe connection delivering gas from the producer to the furnace, means for abstracting a portion of waste gases from the furnace and delivering the same with their heat conserved into the gas-producer, and means for admixing regulated amounts of air with said gases prior to their entry into the producer.

Signed at New York city, in the county of New York and State of New York, this 27th day of March, A. D. 1905.

CARLETON ELLIS.

Witnesses:

A. M. SENIOR,
JAS. K. CLARK.