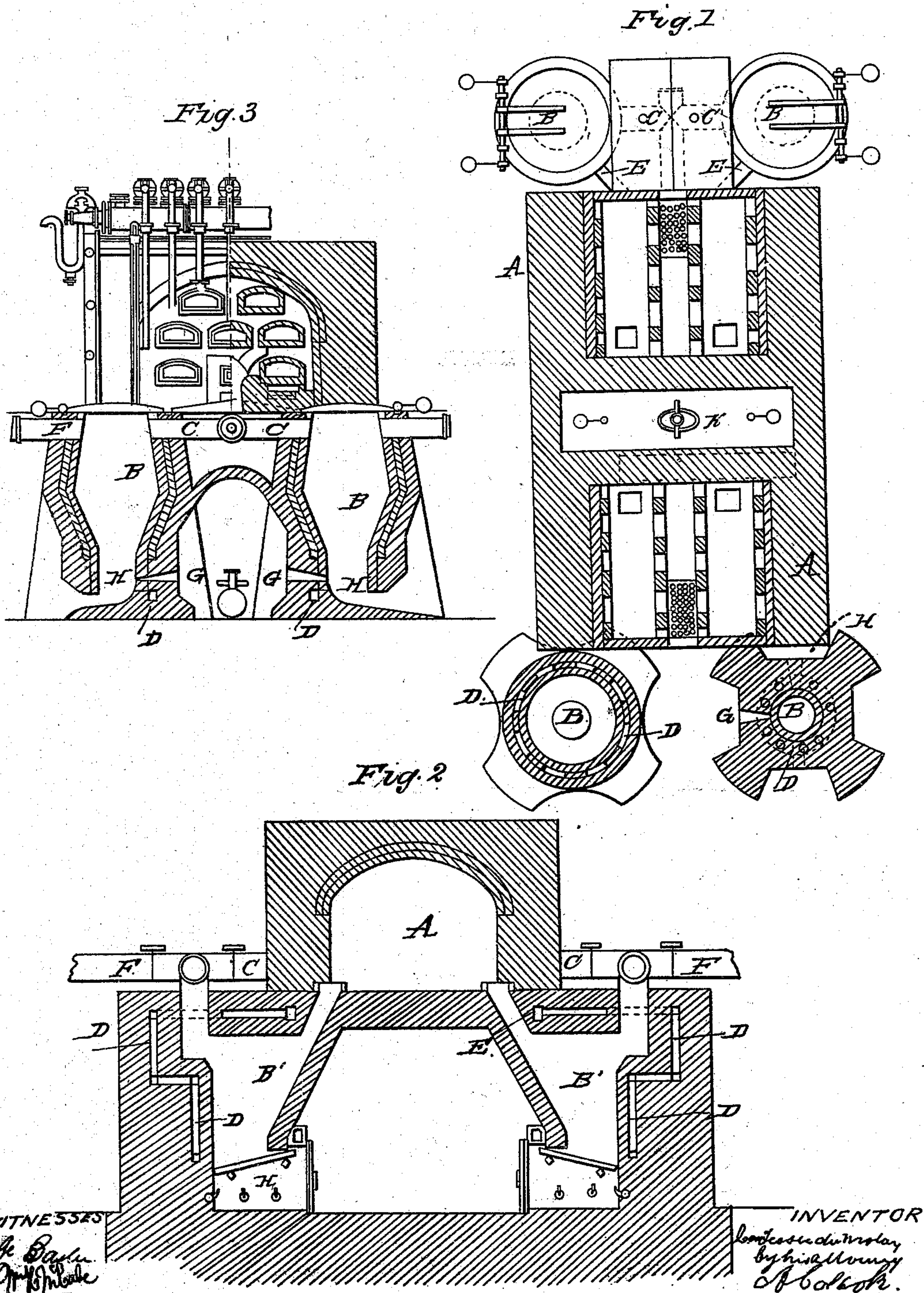


C. M. TESSIE DU MOTAY.

Gas Generator.

No. 87,478.

Patented March 2, 1869.



UNITED STATES PATENT OFFICE

C. M. TESSIÉ DU MOTAY, OF PARIS, FRANCE, ASSIGNOR TO EDWARD STERN, OF NEW YORK, N. Y.

IMPROVEMENT IN PROCESS AND APPARATUS FOR GENERATING COMBUSTIBLE GASES.

Specification forming part of Letters Patent No. 87,478, dated March 2, 1869.

To all whom it may concern:

Be it known that I, CYPRIEN MARIÉ TESSIÉ DU MOTAY, of Paris, in the Empire of France, have invented certain new and useful Improvements in Apparatus for the production of carbonic oxide, hydrogen, and carbureted hydrogens; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings.

This apparatus is composed essentially of two parts, viz: First, a distilling furnace or oven, with retorts resembling those employed in the manufacture of gas; second, two cupolas or grate-furnaces, for the transportation of the coke produced in the retorts of the furnace first mentioned into carbonic oxide, and into hydrogen.

It is not necessary to describe each of these apparatuses in detail, as their construction is a matter of common knowledge, and I will, therefore, confine myself to an explanation of the general arrangement and combination of these parts, in which alone my invention consists.

In the drawings, Figure 1 represents a sectional plan, and Fig. 2 a sectional elevation, of an arrangement of two gas-furnaces and of four cupolas, by which they are accompanied.

A A are the gas-furnaces, in which the distillation of the coal takes place. B B B B are the cupolas intended to effect the transformation of the coke into carbonic oxide and hydrogen. C C are flues for conducting the carbonic oxide, mixed with nitrogen, to the Bunsen burner, which heats the retort of the furnaces A. D D are conduits formed in the walls of the cupolas, and in which the air required for the combustion of this carbonic oxide is heated to a high temperature. E E are flues, which conduct this heated air to the burner. F F are pipes for leading off the hydrogen mixed with carbonic oxide. G G are air-tuyeres. H H are tuyeres for superheated steam. I is a special burner for the combustion of the carbonic oxide which heats the retorts. K is a boiler, designed to generate the steam to be fed through the tuyeres H. The coke produced in the retorts of the furnace A is, the moment it is taken from the retorts, cast into the two cupolas B B. There the coke

burns by the action of the air injected through the tuyeres G G, and is transferred into carbonic oxide. This gas is in part directed to a special burner, which takes the place of the grate of the gas-furnace, and serves to heat the retorts. When the coke is well ignited, and the cupola has reached a high temperature, the supply of air is cut off, and is replaced by superheated steam, which enters through the tuyeres H H. Upon contact with the carbon this steam is transformed into a mixture of hydrogen and carbonic oxide, which is gathered into gasometers by a well-known means. As this operation causes the rapid cooling of the cupola it soon ceases; then steam is shut off, and air is again introduced to thoroughly ignite the mass of coke, and to bring it again to a high temperature, in order that the operation may be renewed, and so on indefinitely. The two cupolas are employed in order that at all times one of them at least shall furnish the carbonic oxide for the heating of the retorts.

Fig. 3 is a vertical section of another arrangement of the same apparatus, in which the furnaces B B are replaced by two grate-furnaces, B' B'.

Under either arrangement I obtain, first, carbonic oxide mixed with nitrogen, resulting from the incomplete combustion of the coke in presence of the air, a part of this gas being employed for the heating of the retorts; second, hydrogen, mixed with carbonic oxide, arising from the action of the steam on the heated coke. This second combustible product is susceptible of giving a much higher temperature than that which can be obtained with the carbonic oxide mixed with nitrogen; third, proto and bi carburets of hydrogen, or light and heavy carbureted hydrogens, resulting from the distillation of the pit-coal or any other fuel capable of giving high temperatures, in producing, reducing, or carbureting actions when needed.

In order to utilize completely the heat which is generated in these apparatuses I employ, first, the waste flames of the gas-furnace to generate the steam used in the cupolas for the production of the hydrogen; second, the specific heat carried away by the gases which issue from the cupola to heat the air and steam

injected in the same cupola, the heating being effected by suitable superheating apparatuses.

The gases thus generated can be employed to produce high temperatures, or to produce, without smoke or fumes, high or medium temperatures; or to produce neutral or oxidizing flames for the metallurgical treatment of ordinary metals; or to reduce metallic oxides; or, lastly, for the chemical displacement of sulphur, chlorine, fluorine, and sulphuric acid, combined with alkaline, earthy alkaline, and metallic bodies.

In conclusion, I desire to state that I do not limit myself to the precise details of the gas-generating apparatus herein described, as it is evident that apparatuses of the nature specified may be combined in an analogous manner to effect the same result—that is to say, to produce simultaneously, and by alternate action, carbonic oxide and pure hydrogen, and carbureted hydrogens; and, therefore,

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

1. The method of generating or producing the gases herein specified, in the manner and by the means substantially such as shown and described.

2. An apparatus for generating or producing carbonic oxide, hydrogen, and carbureted hydrogens, the parts of which are combined and arranged for joint operation, substantially as shown and set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

C. M. TESSIÉ DU MOTAY.

Witnesses:

J. ARMENGAUD,

DAVID T. S. FULLER.