

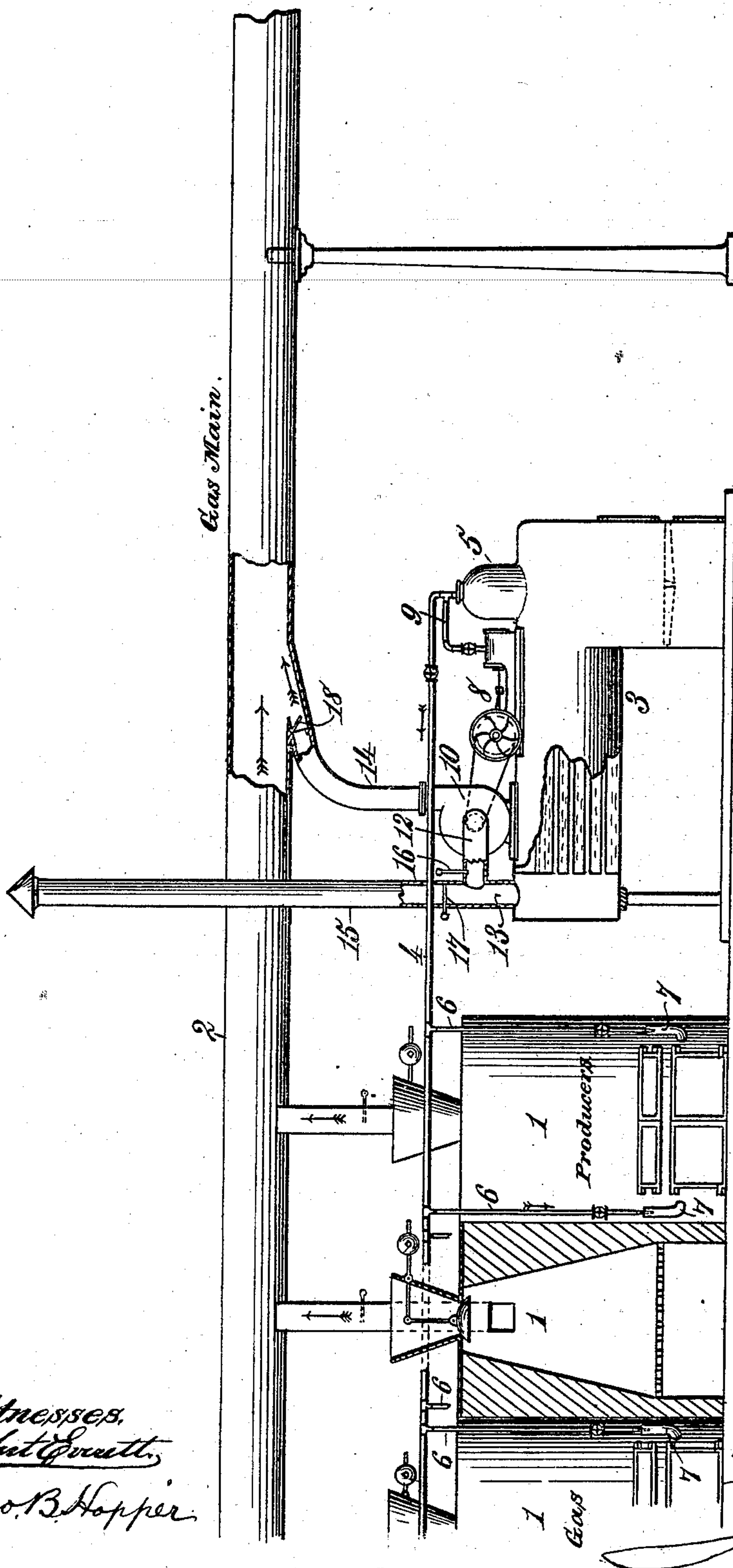
(No Model.)

W. H. FORBES.

METHOD OF AND APPARATUS FOR PROPELLING PRODUCER GASES.

No. 503,842.

Patented Aug. 22, 1893.



Witnesses,  
*Robert G. Smith*  
*Geo. B. Hopper*

Inventor,  
*Wilson H. Forbes.*  
By  
*James L. Norris.*  
*Atty.*



# UNITED STATES PATENT OFFICE.

WILSON H. FORBES, OF JEANNETTE, PENNSYLVANIA.

METHOD OF AND APPARATUS FOR PROPELLING PRODUCER-GASES.

SPECIFICATION forming part of Letters Patent No. 503,842, dated August 22, 1893.

Application filed May 15, 1893. Serial No. 474,217. (No model.)

*To all whom it may concern:*

Be it known that I, WILSON H. FORBES, a citizen of the United States, residing at Jeannette, in the county of Westmoreland and State of Pennsylvania, have invented new and useful Improvements in Methods of and Apparatus for Propelling Producer-Gases, of which the following is a specification.

This invention relates to the working of producer or generator furnaces having steam blast appliances for forcing the gases to regenerator furnaces employed in the manufacture of glass, and for other purposes.

In this type of apparatus it is essential to introduce the steam at high pressure into the producers or generators, for the purpose of obtaining the requisite draft to force the gases through the gas main to the regenerators, and the steam at the necessary high pressure cuts out the brick work structure, which is damaging and therefore objectionable.

The objects of my invention are to enable the producers or generators to be worked with steam at less pressure; to increase the heating capacity of the producer or generator gases, and propel them to the regenerators or other places to be utilized without cutting out or damaging the producer or generator brick work, or danger of an explosion.

To accomplish all these objects my invention consists in the method and apparatus hereinafter described and claimed for propelling and increasing the heating capacity of the producer or generator gases.

In the accompanying drawing the figure is a sectional side elevation, illustrating gas producers or generators, a gas main leading therefrom, and a boiler furnace connected with the gas main in accordance with my invention.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawing, wherein—

The numeral 1 indicates a series of gas producers or generators; 2 the gas main connected therewith in the usual manner for conducting the gases to the regenerator furnaces or other place where such gases are to be utilized.

I do not deem it necessary to illustrate the regenerator furnaces, as they are of well known construction and arrangement.

The numeral 3 indicates a boiler furnace, 55 having a steam conveying pipe 4 leading from the steam dome 5, and having branches 6 connected with tuyeres 7 which deliver steam to the producers or generators for draft purposes. A pump 8, mounted upon, or otherwise arranged in juxtaposition to the boiler furnace, is provided with a steam pipe connection 9 with the steam dome 5, and this pump is geared to the shaft of an exhausting and forcing apparatus, such as a rotary blower 60 10, having the exhaust pipe 12 connected with the smoke box 13 of the boiler furnace, and the branch 14 connected with the gas main 2. The pipe 12 and the smoke stack or chimney 15 of the boiler furnace may be provided with dampers or valves 16 and 17, whereby the products of combustion from the boiler furnace may be caused to pass out of the smoke stack or chimney, or into the exhausting and forcing apparatus. The 75 pipe 14 leading from the exhausting and forcing apparatus is preferably provided with a valve 18 which permits the products of combustion to flow into the gas main, but prevents back flow into the pipe 14. When the 80 producers or generators are working, the products of combustion from the boiler furnace are conducted into the gas main, and serve to propel the producer or generator gases through the gas main to the regenerator furnaces, or other place or places where the gases 85 are to be utilized, and, by the mingling of the products of combustion with the producer or generator gases, increasing the heating capacity of the latter, which is a very desirable 90 feature in working glass furnaces where a very high temperature is essential.

By propelling the producer or generator gases through the medium of products of combustion from a separate furnace forced into 95 the gas main, it is possible to materially reduce the pressure of the steam delivered to the tuyeres of the producers or generators, which is a very important and desirable feature, in that ordinarily the gases from the 100 producers or generators are forced through the gas main by the pressure of steam in-



introduced into the producers or generators by the tuyeres, and this high pressure cuts out the brick work structure, and is damaging. By my invention this is avoided, and the heating capacity of the producer or generator gases is materially increased without danger of an explosion which would likely result if atmospheric air were forced into the gas main, and without liability of choking up the gas main by the rapid accumulation of carbon, as would likely occur if steam were introduced directly into the gas main to the gases in transit to the regenerator furnaces.

By forcing the products of combustion from the boiler furnace into the gas main, the gases from the producers or generators are propelled to the regenerator or other furnaces used in the manufacture of glass, and for other purposes in factories, and the heating capacity of the producer or generator gases is materially increased; while the steam pressure employed to create the usual artificial draft in the producers or generators can be greatly reduced to avoid damage by cutting incident to steam entering at a high pressure.

Having thus described my invention, what I claim is—

1. The herein described method of propelling producer or generator gases and increasing their heating capacity, which consists in passing into a gas main the producer or generator gases from a gas producer or generator, introducing the products of combustion from the burning fuel in a separate furnace into the producer or generator gases in transit through the gas main, and causing said products of combustion to force the generator gases through the main, substantially as specified.

2. The herein described method of propelling producer or generator gases and increasing their heating capacity, which consists in passing into a gas main the producer or generator gases from a gas producer or generator, and delivering under pressure the products of combustion from the burning fuel in a separate furnace into the producer or generator

gases in transit through the gas main, substantially as specified.

3. The combination with a gas producer or generator, and a gas main connected therewith for conveying the producer or generator gases therefrom, of a separate furnace having a conduit for its products of combustion connected with said gas main for propelling the producer or generator gases therethrough, substantially as described.

4. The combination with a gas producer or generator, and a gas main connected therewith for conveying the gases therefrom, of a furnace separate from the gas producer and a forcing apparatus connected with the gas main and with said separate furnace for forcing the products of combustion therefrom into the gas main to propel the producer or generator gases in the latter, substantially as described.

5. The combination with a gas producer or generator, and a gas main connected therewith for conveying the gases therefrom, of a boiler furnace separate from the gas producer, and a forcing apparatus connected with the boiler furnace and with the gas main for forcing the products of combustion from the boiler furnace into said gas main to propel the producer or generator gases therethrough, substantially as described.

6. The combination with a gas producer or generator, and a gas main connected therewith for conveying the gases therefrom, of a separate boiler furnace, having steam pipe connections with the producer or generator, and a forcing apparatus connected with the boiler furnace and the gas main for forcing the products of combustion from the boiler furnace into the gas main to propel the producer or generator gases therethrough, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

W. H. FORBES.

Witnesses:

ALBERT H. NORRIS,  
G. W. REA.