

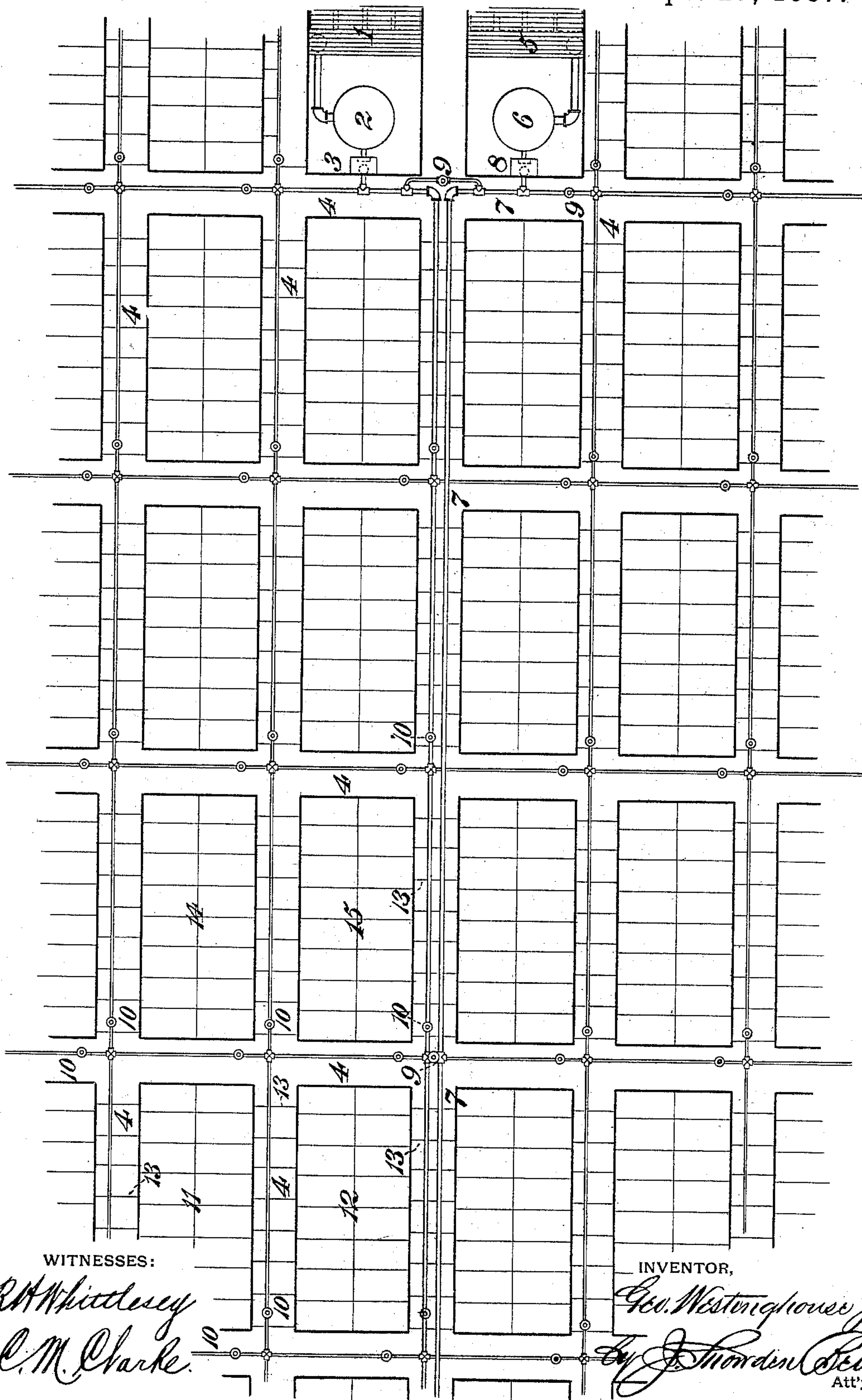
(No Model.)

G. WESTINGHOUSE, Jr.

GAS SUPPLY SYSTEM.

No. 370,510.

Patented Sept. 27, 1887.





# UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, JR., OF PITTSBURG, PENNSYLVANIA.

## GAS-SUPPLY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 370,510, dated September 27, 1887.

Application filed December 18, 1886. Serial No. 221,932. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE WESTINGHOUSE, Jr., residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered a certain new and useful Improvement in Gas-Supply Systems, of which improvement the following is a specification.

The object of my invention is to enable the supply and distribution of either fuel-gas or illuminating-gas in any desired portion or portions of a city or supply district to be effected without necessarily involving the employment of a duplicate system of pipes or mains throughout the area to be supplied, the invention being particularly designed for application in the conversion in a practical and systematic manner of a gas-plant for illuminating purposes into a plant suitable for the supply of fuel-gas.

To this end my invention, generally stated, consists in the combination, with a system of gas-supply mains, of a fuel-gas producer, a special main leading therefrom and adapted to deliver gas directly into service-pipes and into the supply-main system, a series of valves governing the delivery of fuel-gas to different portions of said system, and a series of service-pipes leading out of said system and provided with pressure-regulators.

The improvement claimed is hereinafter fully set forth.

The pressure carried in a system of supply-mains, such as is ordinarily employed for the distribution of illuminating-gas, is equal to a column of water from one and one-half inch to two and one-half inches high, and the service-pipes leading therefrom are usually about the size required for supplying the requisite amount of illuminating-gas at such pressure; but these service-pipes under the pressure usually carried for illuminating purposes are wholly inadequate in capacity for the supply of a sufficient amount of gas for heating purposes and the main pipes are likewise insufficient to convey the requisite quantity of fuel-gas.

In view of the satisfactory results attained in practical service with the electric light and the constantly-increasing demand therefor, it is deemed probable by many who have given consideration to the subject that the intro-

duction of the electric light will within a reasonable period be so far extended as to render in many instances investments in illuminating-gas plants unprofitable, unless the same can be utilized for other purposes; and my invention is particularly designed to provide for the supply of heating or fuel gas to such portions of a town or district in which the electric light has been adopted to the substantial exclusion of illuminating-gas without duplication of mains or interruption of the supply of illuminating-gas in other portions of the same town or district.

A further purpose of the invention is to provide for the supply of fuel-gas and electric light by means of apparatus located in the same works, in order that the waste heat evolved in the manufacture of fuel-gas may be made available for the generation of steam to actuate the apparatus for producing electricity for the lights.

The accompanying drawing is a diagrammatic plan view of a portion of a town, illustrating the application of my invention.

The supply of illuminating-gas is shown as provided by a gas-generating apparatus, 1, which delivers the illuminating-gas produced to a gas-holder, 2, and thence by proper valves and meters located in a valve-house, 3, and adapted to control and measure the gas to a system of supply-mains, 4, laid under the streets in the usual manner and extending throughout the service district.

In the practice of my invention a fuel-gas generating apparatus, 5, and gas-holder 6, connected therewith, is erected at any convenient point, preferably convenient to the illuminating-gas works when the same are favorably located with due regard to the economical production of gas, although the particular location of the fuel-gas works is not material in carrying out the objects of the invention.

A fuel-gas main, 7, the supply of gas to which from the holder 6 is measured and regulated by meters and valves in a valve-house, 8, is laid in such relation to the system of illuminating-gas-supply mains 4 as to be adapted, first, to distribute gas for heating purposes along its own line, and, second, to supply fuel-gas to such portions of the illuminating-gas-supply mains as may be desired, as herein-



after to be described. The holder 6 and valves in the valve-house 8 are constructed to maintain a pressure of from one to two pounds in the fuel-gas main 7.

5 In order to admit of the supply of fuel-gas to sections where the supply of illuminating-gas may be discontinued, the fuel-gas main 7 is connected at one or more points with the system of illuminating-gas-supply mains 4, a  
10 stop cock or valve, 9, for turning on and off the gas being interposed at each connection. The illuminating-gas-supply mains 4 are provided with stop-valves 10, located in such position  
15 that different sections of the mains 4 may be cut off from the remainder of the system as desired; and it should be noted that before using the illuminating-gas mains for fuel-gas purposes the sections of the same which are  
20 to serve therefor must be carefully examined, their joints made as tight and secure as practicable, and suitable safety devices and escape-pipes for carrying off any gas that may escape under the increased pressure which is necessary for the purpose of distributing fuel-gas be  
25 provided.

As an illustration of the operation of the invention, let it be assumed that it is desired to discontinue the supply of illuminating-gas to the two blocks of buildings indicated by 11  
30 and 12 and to supply the same with fuel-gas. Those portions of the system of illuminating-gas-supply mains 4 which are to be used to establish communication between the fuel-gas main 7 and the service-pipes 13 of the blocks  
35 11 and 12, having been previously tested and fitted with safety appliances for carrying the higher pressure, as before specified, the stop-valves 10 between such portion of the system of mains 4 and the remainder thereof are  
40 closed and the valve 9 is opened, permitting the fuel-gas which is constantly under pressure in the main 7 to pass into the portions of the system of mains 4 requisite for the supply of the blocks 11 and 12 and into  
45 the service-pipes 13 of the several buildings of said blocks.

Each of the service-pipes 13 leading into the houses of the blocks supplied with fuel-gas is provided with a suitable automatic  
50 pressure-regulator, which is located in any convenient position, and is not shown in the drawing by reason of its small scale. Instances of devices proper for the purpose may be found in Letters Patent of the United  
55 States Nos. 312,543, 324,905, 341,295, and 352,382, and others. The pressure-regulator serves to insure the supply of gas to the house at a constantly-uniform pressure, notwithstanding fluctuations of several ounces per  
60 square inch in the main, and when provided

with a cut-off attachment, as is preferable, to shut off the admission of gas should the pressure of gas fall below a determined limit. The service-pipes, under the increased pressure maintained in the fuel-gas mains, will be of  
65 sufficient capacity to deliver the quantity of gas required for heating purposes within the houses without enlargement or change, while the regulator for each house insures safety and security from the dangers attending the  
70 use of fuel-gas, it having been found that it is otherwise impracticable with fuel-gas to maintain a constantly-uniform pressure without making the pipes of very large size, and thus making the cost of a plant too great to permit  
75 of the economical distribution of fuel-gas in this manner.

When the portions of the system of illuminating-gas mains 4 leading to other blocks, as 14 and 15, have been properly prepared for  
80 the distribution of fuel-gas, additional stop-valves 10 may be closed to shut off other portions of the system 4 and other stop-valves 9 opened to establish communication with the fuel-gas main 7.  
85

I further design to provide the main 7 with branches of considerable size extending to different sections of the district, whereby fuel-gas may be supplied thereto without interrupting the supply of illuminating-gas except  
90 in such places as have been previously determined upon.

I claim herein as my invention—

1. The combination of a fuel-gas producer, a special supply-main leading therefrom, a  
95 second and independent system of gas-supply mains, a series of valves governing the delivery of gas from the producer-main to different portions of the independent supply-main system, and a series of service-pipes leading out of said system, substantially as set forth.  
100

2. The combination of a fuel-gas producer, a special supply-main leading therefrom, a  
105 second and independent system of gas supply mains, a series of valves governing the delivery of gas from the producer-main to different portions of the supply-main system, a series of service-pipes leading out of said system, and a series of pressure-regulators controlling said service-pipes and adapted to effect a reduction of delivery-pressure therein, substantially as set forth.  
110

In testimony whereof I have hereunto set my hand.

GEO. WESTINGHOUSE, JR.

Witnesses:

R. H. WHITTLESEY,  
C. M. CLARKE.