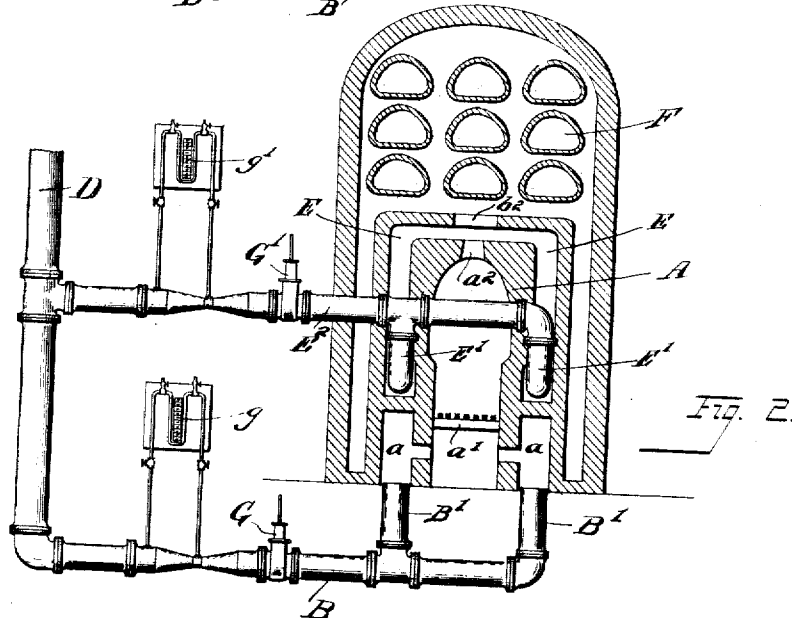
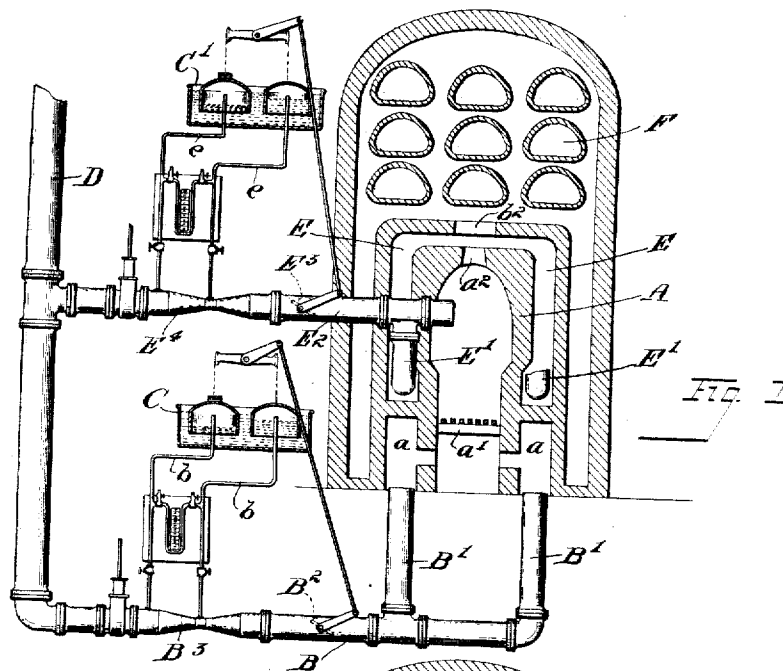


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 APPARATUS FOR USE IN THE MANUFACTURE OF GAS.
 APPLICATION FILED OCT. 15, 1909.

949,841.

Patented Feb. 22, 1910.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR USE IN THE MANUFACTURE OF GAS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PIERRE PLANTINGA, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Apparatus for Use in the Manufacture of Gas, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to apparatus for use in the manufacture of gas, and particularly to that part of such apparatus which includes means for making producer gas, which is burned for the purpose of producing the heat required for further steps in the process.

The object of my invention is to obtain a predetermined temperature resulting from the combustion of the producer gas, whereby such temperature may be made constant and the next step in the operation thereby rendered definite.

In the apparatus heretofore used, the supply of primary and secondary air has been more or less dependent upon weather and other extraneous conditions, which have caused the temperature of the burning producer gas to vary, thereby varying the resultant gas product in a deleterious manner, as will be readily understood by those skilled in the art. This variation has heretofore been partly overcome by the employment of a high stack for taking off the gases of combustion, and one of the results of my invention is to eliminate the necessity for such high stack, a material economical advantage, as is obvious.

The annexed drawing and the following description set forth in detail certain mechanism embodying my invention, the disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—Figure 1 is a diagrammatic view of gas apparatus embodying my invention, showing a muffie furnace and gas producer in vertical axial section. Fig. 2 is a view similar to that shown in Fig. 1, and illustrating a modified form of my invention.

Referring to the drawing, the gas producer A is of the usual form, and is provided with two ducts *a a*, for leading primary

air under the grate *a'*, thence passing upwardly through the coal bed, and out of the top aperture *a''*. Two branch air pipes *B' B'* are connected with these ducts *a* and are themselves connected with an air pipe B, affording a common source of supply for such branch pipes *B'*. A diaphragm or valve *B''* consisting of a transversely-placed movable plate is placed in pipe B and is connected with a pressure device C, the latter being operated by means of a Venturi-tube *B'''* interposed in the pipe B, connected with the pressure-operated device C by means of suitable tubes *b b*, as is readily understood. A main D supplies the air to the pipe B. The pressure-operated device is so arranged that a decrease in the volume of air flow past a given point per unit of time, in the pipe B, will cause the valve *B''* to open and permit a larger quantity of air to pass. In this manner, by adjusting the valve *B''*, a constant rate of flow of a predetermined quantity of air through the duct B may be obtained, and therefore supplied to the producer. The latter is furthermore supplied with two ducts *E E* for leading the secondary air to the point *b''* where the producer gas is burned, such air being necessary for proper combustion at said point. The two branch pipes *E' E'* connect with these ducts *E E*, and are themselves connected with a pipe *E''*, affording a common source of air for both said ducts.

A valve *E'''* is provided in pipe *E''*, and is connected with a second pressure device *C'*, operating in the same manner as does the device C, a Venturi-tube *E'''* and tubes *e e* being provided for this purpose, as will be readily understood. The pipe *E'''* is connected with the common main D. It will therefore be noted that a constant flow of air through the pipe *E''* may be maintained, and a constant supply of air be delivered at the point *b''*.

Located above the producer and suitably inclosed are the muffles or retorts F, which are heated by the flame produced by the combustion of the producer gas at the point *b''*, such heat being necessary for the proper distillation of the contents of the retorts, as will be readily understood. A suitable opening (not shown) is provided in the inclosing structure for conducting away the products of the combustion of such gas, as will be readily understood.

By means of the above described appa-

ratus, the quality of the gas produced by the producer is maintained constant, as well as the supply of air for the combustion of such gas. By suitably adjusting the valves B² E³, it will be seen that after the quality of the gas and the quantity of air has been predetermined to produce the most economical combustion of the gas, these predetermined conditions may be maintained so as to maintain a constant temperature to which the retorts are subjected. A uniform quality of gas is therefore produced in the retorts, such being the object sought for.

In the modified form shown in Fig. 2, the automatic feature is omitted, and the device arranged so that it may be manipulated manually. In this case the pressure-operated devices are omitted, as well as the automatically-operated valves E³ E². In place of these latter, there is supplied two manually-operated valves G G'. The Venturi-tubes are connected with the pressure gages g and g', by means of which the flow of air through the pipes B and E² may be read. By manually operating the valves G and G', therefore, the predetermined quantity of air may be supplied to the producer and to the tubes, B' E', so as to bring about the conditions above noted. In this case, however, an attendant is required who can manually operate the valves G and G', when the corresponding gage indicates a diminution or increase of the flow, as will be readily understood.

Having fully described my invention, what I claim therefor and desire to secure by Letters Patent is:—

1. In apparatus for use in the manufacture of gas, the combination of a gas producer; means for supplying the primary air to the producer; means for supplying the secondary air to the apparatus; and means for automatically regulating the flow of such secondary air so as to maintain a flow of a constant volume per unit of time past a given point in the secondary air duct.

2. In apparatus for use in the manufacture of gas, the combination of a gas producer; means for supplying the primary air to the latter; means for supplying the secondary air to the apparatus; and means for automatically regulating the flow of such primary and secondary air, so as to maintain a flow of a constant volume of air per unit of time past a given point in their respective ducts.

3. In apparatus for use in the manufacture of gas, the combination of a muffle furnace; a gas producer; means for supplying the primary air to the latter; means for supplying the secondary air to the apparatus; means for regulating the flow of such primary and secondary air, and means for measuring such flow, whereby the flow of air through the primary and secondary air ducts may be made of a predetermined volume per unit of time past a given point in such ducts respectively.

Signed by me, this 9th day of October, 1909.

PIERRE PLANTINGA.

Attested by—

CURT. B. MUELLER,
A. E. MERKEL.