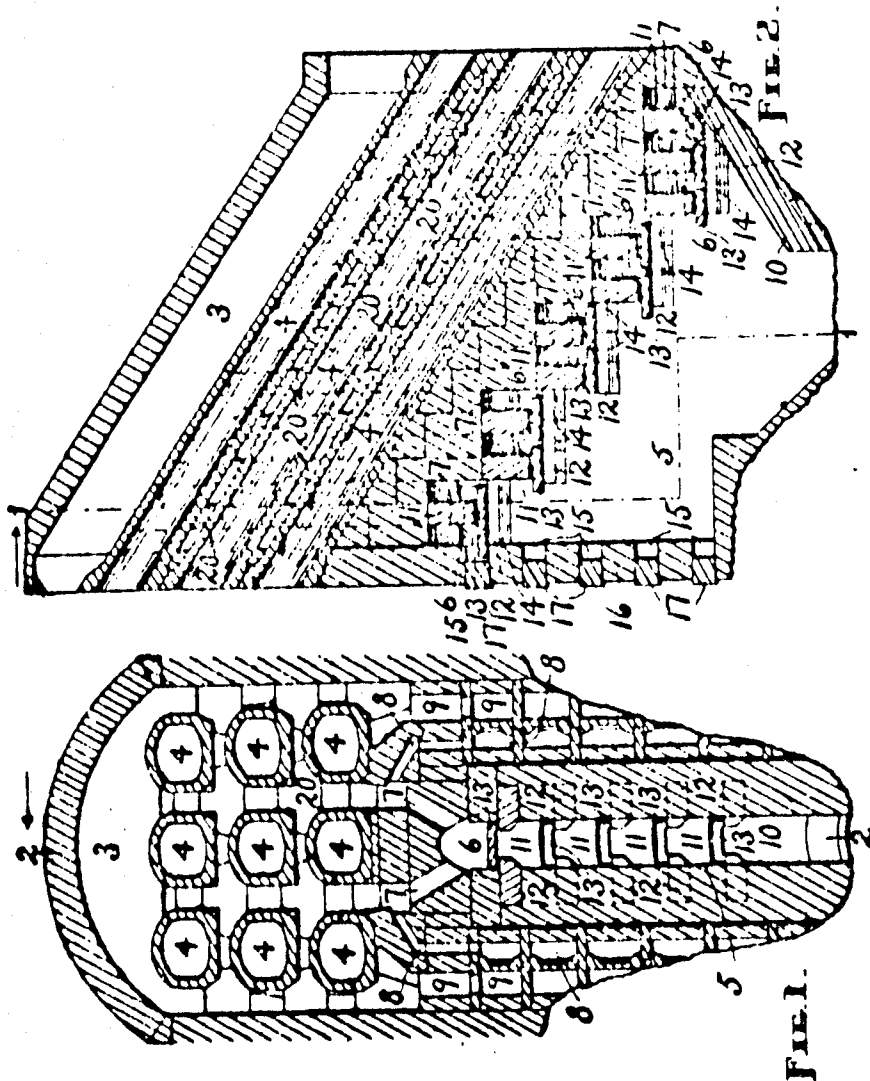


H. BURGI.
 GAS RETORT BENCH.
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WITNESSES:
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1,000,987. GAS-RETORT BENCH. HERMAN BURGI, Springfield, Mass., assignor of one-half to Charles Henry Tenney, Hartford, Conn. Filed May 16, 1908. Serial No. 433,180.

To all whom it may concern:

Be it known that I, HERMAN BURGI, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Gas-Retort Benches, of which the following is a specification.

My invention relates to improvements in benches used in the distillation of illuminating gas, in which I provide means for directing and controlling in a positive and certain manner the gas, carbon monoxid (CO), which is generated below what is commonly known as the oxid flue and which rises into such flue, as said gas leaves the latter to pass upward to the chamber where the retorts are located, as hereinafter set forth.

Hitherto much difficulty has been experienced in maintaining an approximately even heat throughout the entire areas of the retorts which contain the coal from which the illuminating gas is produced, owing to the fact that the distribution of the calorific medium from the main or oxid flue is uneven; and the object of my invention is to overcome this difficulty by providing a bench in which such distribution can be properly directed and regulated, to the end that an increased quantity of illuminating gas can be produced from a given amount of coal, and this with the consumption of less coke to supply the heat required for the distillation of the gas from the coal. I attain this object by the means illustrated in the accompanying drawings, in which—

Figure 1 is a vertical cross-section of so much of a gas-retort bench as is required to illustrate my invention which is embodied therein, such view being taken on lines 1-1, looking in the direction of the arrow, in Fig. 2, and, Fig. 2, a longitudinal vertical section on lines 2-2, looking in the direction of the arrow, Fig. 1.

Similar figures refer to similar parts throughout the several views.

In the bench herein shown, the retorts are arranged obliquely and the groups of passages leading from the oxid flue are stepped, but my invention is equally applicable to a bench in which the retorts lie horizontally and the passages from the oxid flue are not stepped.

Generally speaking this invention consists of apron walls, hereinafter termed simply aprons, across the main or oxid flue between the branch passages leading from

said flue, and of baffle-plates at the entrances to such passages. Baffle-plates in themselves when remotely located relative to the openings at the top of the aforesaid flue are old, but the application of such plates directly to such openings for which they in reality form shutters is structurally as well as functionally new and novel. The baffle-plates could not be applied in this way, however, were it not for the presence of the aprons. The aprons are provided wherever there are no other walls to separate the mouths of the passages leading from the top of the oxid flue and assist in forming such passages, so that there is an opportunity for the baffle-plates to be utilized to advantage in admitting the carbon monoxid to said passages. In a bench thus constructed the products of combustion, in the oxid flue are definitely directed or admitted to the several passages leading from said flue instead of being permitted to escape from the flue in a more or less haphazard manner.

In the drawings a portion of a bench is shown in which appear a chamber 3 at the top having therein a plurality of gas retorts 4 inclined downward from back to front, a central vertical flue 5 which is the main or oxid flue, a plurality of Y-shaped passages leading from said flue into said chamber, each of said Y-shaped passages consisting of a vertical part or passage 6 and two lateral oblique branches or passages 7, side passages 8 for air, and other side passages 9 for the spent-gases, both sets of said air and spent-gas passages and said passages 7 opening at the top into the chamber between transverse vertical walls or partitions 20 which assist in supporting said retorts and divide all but the upper portion of the chamber into flame passages that are in the same vertical planes with the Y passages. The aforesaid Y-shaped passages are grouped together on different levels in the usual manner. With the exception of the lower terminals 6 of said Y passages, the above-mentioned members are old and well-known

as is also the slanting generator-apron wall 10 at the front. The passages 6 are formed by means of aprons 11 which depend from the top of the flue 5 to serve as front and rear walls for said passages except where the usual masonry of the bench answers for this purpose.

Arranged directly under the aprons 11 and the passages 6, on supporting ledges or brackets 12 which project into the flue 5 from both sides, are baffle-plates 13, there being one such plate generally for each of said passages. The baffle-plates are adapted to be moved forward and backward on the brackets 12 so as to leave openings 14 between the baffle-plates themselves and between them and the sides of the passages

6 for the escape of the carbon monoxid from the flue 5, such openings being beneath said passages of course. By varying the size of any opening 14 the volume of carbon monoxid which is permitted to enter the passage above is accordingly varied, and it is in this way that I am able to completely control the supply of heat to the retort chamber. The baffle-plates 13 at any level are shifted in the usual manner by means of a suitable implement introduced into the flue 5 through a corresponding opening 15 in the rear wall 16 of said flue, after removing a closure 17 from such opening.

In practice, assuming that the baffle-plates 13 have been properly arranged to start with and that their positions will be changed from time to time as may be found expedient, the products of combustion in the flue 5 find their way into the chamber 3 through the openings 14, the passages 6, and the passages 7 which branch off from the latter and open at the top into said chamber, between the partitions 20 therein, both sides of the longitudinal center thereof. In the chamber 3 between the partitions 20 air from the passages 8 mixes with the carbon monoxid and this mixture is burned in the spaces between said partitions to heat the retorts 4 and cause the gas in the coal contained in said retorts to be liberated. The spent gases in the chamber 3 escape therefrom through the passages 9.

I am aware that a gas retort bench has heretofore been constructed wherein the gas passed from the primary gas chamber into three separate supplementary chambers from which chambers small conduits extended at different elevations to the retort chamber and dampers arranged between the primary gas chamber and the supplementary gas chambers. I have found, however, from actual experience that benches so constructed do not give the desired result for the reason that the retort chamber is necessarily arranged at an angle and there is a difference

in vacuum between the lower and upper ends of the retort chamber of one-half inch water, so that where the individual conduits extended to the retort chamber cannot be controlled by dampers each independent of the other the flow of gas to the retort chamber will be through the conduit of least resistance, this being the conduit extending to the point of greatest vacuum, and when the volume of gas is not sufficient to fill all the individual conduits such gas as flows through these conduits will pass through those opening in the retort chamber at the lowest level. This results in creating a partial vacuum in the supplementary gas chambers causing a down-flow of air from the mixing chamber resulting in a mixture of gas and air in the supplementary gas chambers, which mixture burns and

produces an extremely high degree of heat causing fusion of the structure. I am also aware that an effort has been made to overcome this difficulty by the omission of the supplementary gas chambers constructed as above described and providing for a flow of gas to and through a chamber of small area from which the individual conduits extended to the retort chamber. With such construction, however, a similar difficulty arises because of the fact that a partial vacuum is produced as above described and a down-flow of air through some of the conduits results because of the difference in vacuum between the lower portion of the retort chamber and a higher point, so that with such constructions it has been found impossible to maintain gas retort benches permanently as the mixture of gas and air in the supplementary chamber, whether it be one or more, results in the production of an extremely high heat and destruction of the structure. I have also found by the employment of such structures gas cannot be produced of a uniform quality and at as small an expense as results from the employment of my construction wherein I provide individual dampers for each conduit so that, under all the varying conditions which arise in the manufacture of gas, the flow from the gas chamber to the retort chamber through each conduit may be controlled without reference to the flow through any other conduit. I am able, therefore, with my construction, to so regulate the bench as to avoid the disastrous heating which has heretofore resulted and am enabled to manufacture gas of a uniform quality at less expense than has been possible heretofore by the old style of construction of gas retort bench.

It will thus be clearly seen that this invention enables me to direct in greater or less volume the heating medium from the main flue to any particular part of the chamber in which it is to be consumed, with the result that I maintain an even heat, burn less coke, and obtain more illuminating gas.

The construction and arrangement of the baffle-plates are such that any or all of the passages 6 can be closed thereby.

There is more or less difference in the construction of benches, and it is to be understood that I do not confine my invention to the particular construction herein shown and described, it being applicable and adaptable to all benches in which the same general characteristics are to be found, and for this reason I seek to claim said invention broadly.

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

1. In a device of the class described, the combination with a retort, of a series of combustion chambers of approximately the

same length extending across said retort at intervals having gas inlets adjacent said retorts, separate adjustable dampers for said inlets, means for adjusting said dampers, and means for supplying air to said combustion chambers.

2. In a device of the class described, the combination with a retort, of a series of combustion chambers of approximately the same length extending across said retort at intervals having gas inlets adjacent said retorts, all of said inlets being approximately the same distance from said retort, a single gas supply chamber communicating with all of said inlets, separate adjustable dampers for said inlets, means for adjusting said dampers, and means for supplying air to said combustion chambers, whereby the heat in the various combustion chambers may be controlled and rendered uniform and will be concentrated on said retort.

3. In a device of the class described, the combination with a series of elongated retorts, of a gas supply extending along said retorts, a wall of approximately uniform thickness separating said retorts from said gas supply having passages therein extending transversely of said retorts at intervals constituting combustion chambers, a separate adjustable damper for the inlet to each of said passages whereby the combustion in said passages may be controlled and rendered uniform, means for operating said dampers, and means for supplying air to said combustion chambers, the length of said passages being such as to bring the point of highest heat at said retorts whereby it will be absorbed.

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Witnesses:

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A. C. FAIRDANKS.