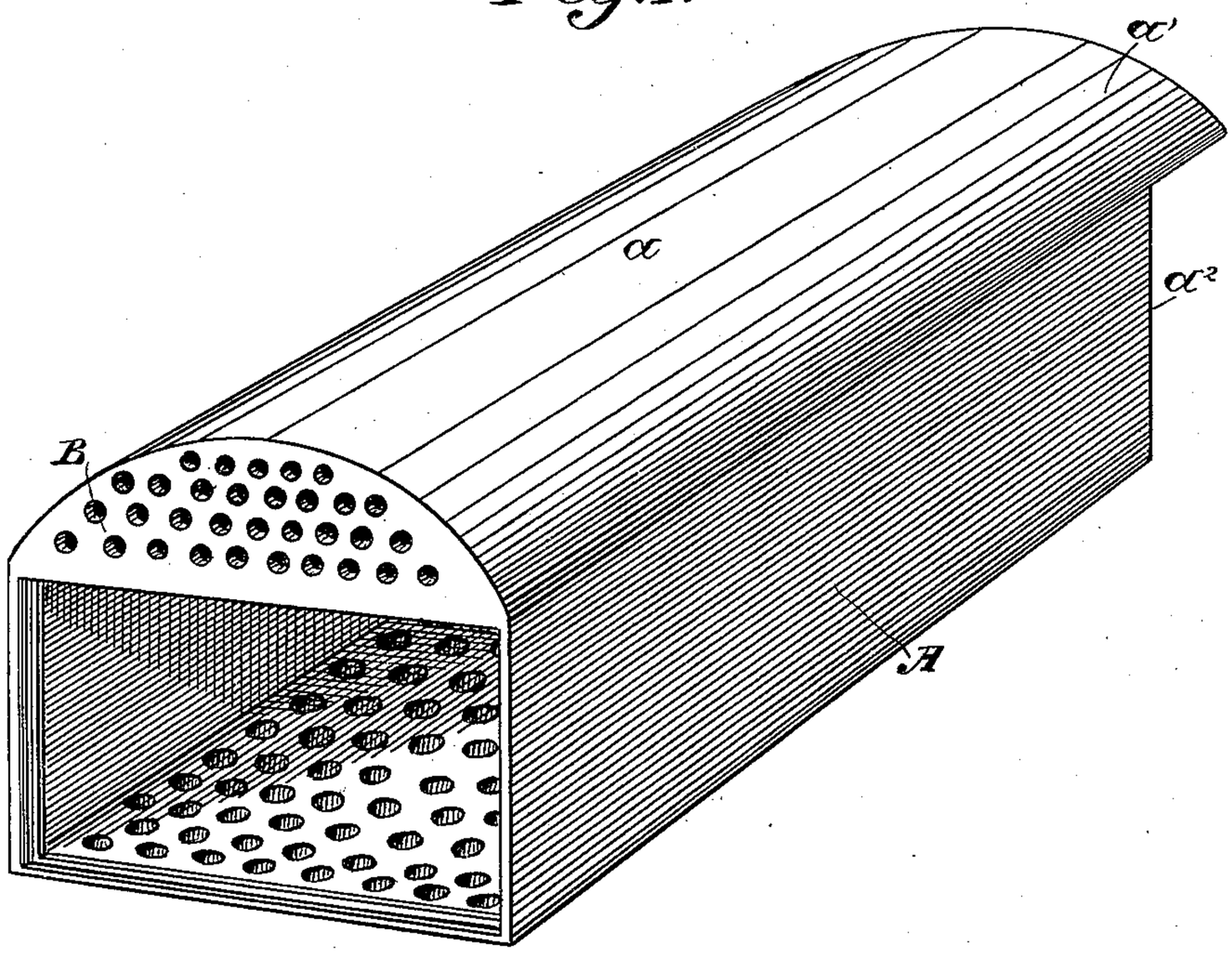
(No Model.) 2 Sheets—Sheet 1.

J. MARTIN.

FUEL GAS RETORT.

No. 540,505. Patented June 4, 1895.

Fig. 1.



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Inventor,
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By Dewey & Co.
Attys.

(No Model.) 2 Sheets—Sheet 2.

J. MARTIN.

FUEL GAS RETORT.

No. 540,505. Patented June 4, 1895.

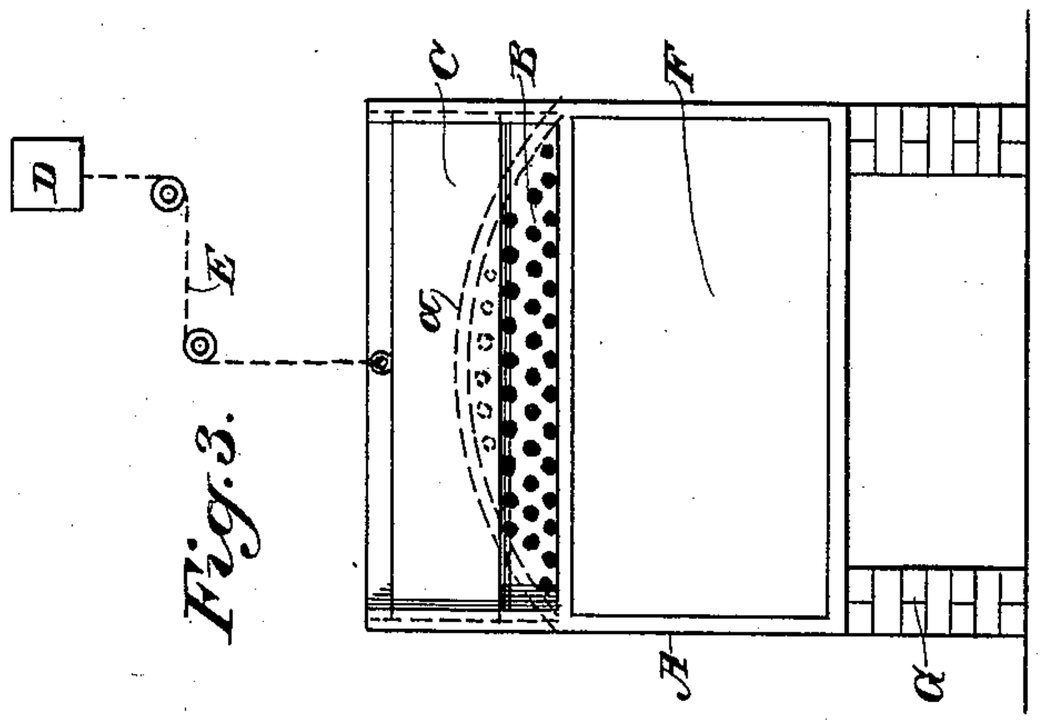

Fig. 3.

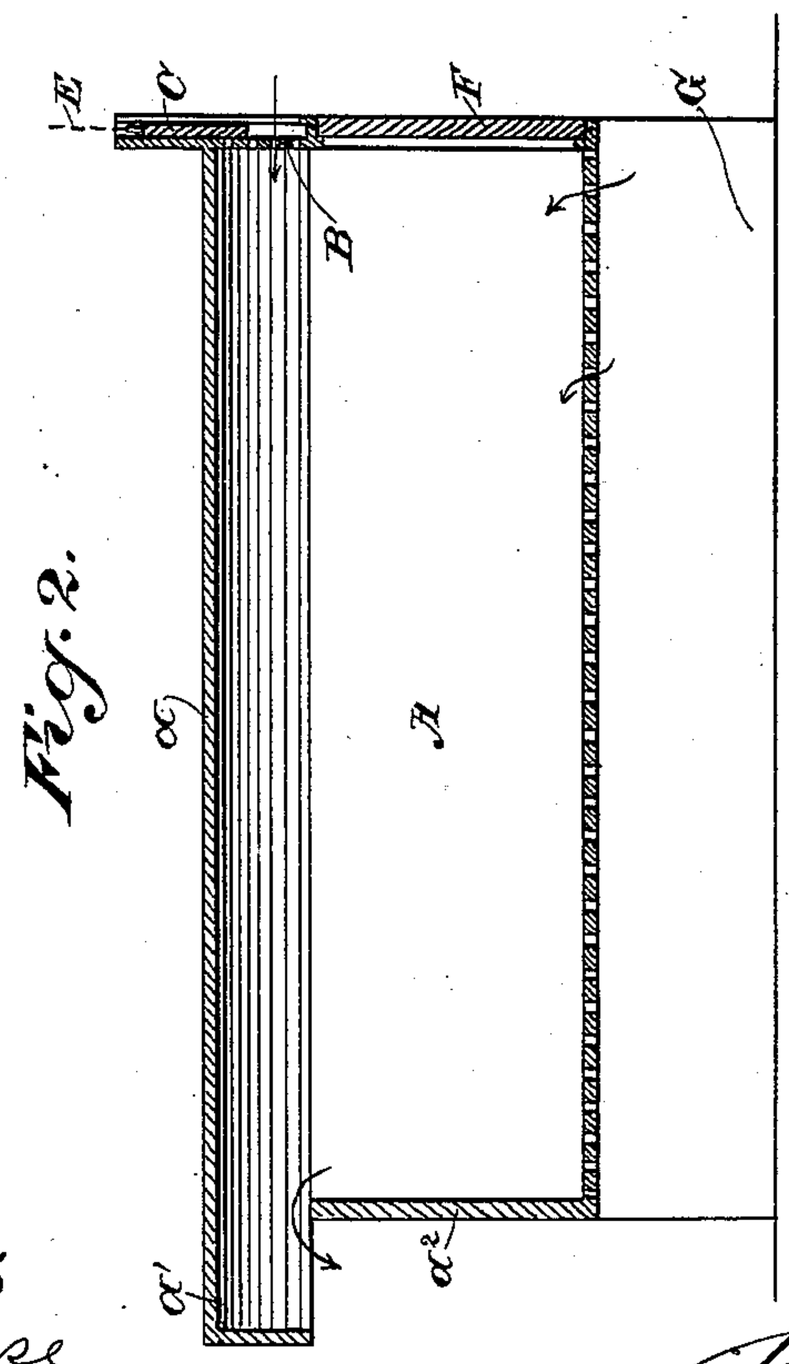

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN MARTIN, OF BERKELEY, CALIFORNIA.

FUEL-GAS RETORT.

SPECIFICATION forming part of Letters Patent No. 540,505, dated June 4, 1895.

Application filed November 1, 1894. Serial No. 527,621. (No model.)

To all whom it may concern:

Be it known that I, JOHN MARTIN, a citizen of the United States, residing at Berkeley, county of Alameda, State of California, have invented an Improvement in Fuel-Gas Retorts; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a retort for generating what may be termed "fuel gas," that is to say, a gas resulting from the combustion of fuel when mixed with the proper amount of air, and properly generated and mixed in a retort from which it may be conveyed to any suitable point.

My invention consists in the novel construction and arrangement of the retort which I shall hereinafter fully describe and specifically claim.

The object of my invention is to obtain the highest efficiency of coal as a fuel by such a union of elements therein under combustion, with a proper amount of air, so that the largest or highest number of heat units may result from each pound of fuel.

In the combustion of coal, the chemical union of one part of carbon with one part of oxygen, producing carbonic oxide, gives four thousand five hundred heat units per pound of carbon. When, however, the same amount of carbon is mixed with double the quantity of oxygen, forming carbonic di-oxide, or carbonic acid gas, there results approximately fourteen thousand five hundred heat units from the same pound of carbon. In the following arrangement and construction of retort, provision is made for the proper proportion of oxygen to be admitted, and come in contact with the carbon when in process of combustion, so that the gases which will arise from said combustion, will attain, as near as possible, the highest efficiency attainable. In addition to the mixing of the oxygen with the carbon to produce these results, there is also the advantage obtained of a proper admixture of oxygen with the hydrogen which is in the coal. Heretofore, the ordinary methods of producing gas in retorts have required that the coal be placed in a sealed apartment, with but one outlet, namely, that for the escaping gas, and no provision has been made whatever for the admission of oxygen to produce a fuel gas giving better results and higher efficiency per pound of fuel consumed or utilized.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a perspective view of my retort. Fig. 2 is a longitudinal vertical section of the same, showing it mounted. Fig. 3 is a front view of same.

The shell or casing which forms the retort A, may be made of any suitable material. It is here shown as a vessel having an arched roof or top a, and a point of novelty to be noticed in the construction of this retort is that the rear extremity a' of the roof, projects over and beyond the rear wall a^2 of the retort, the top of which only comes high enough to leave the roof space clear, here shown, for example, as extending upwardly to the base of the arch.

At the front of the retort, the space inclosed by the arched roof, is closed in as at B, and is provided with a number of holes throughout its area. In conjunction with this perforated portion B, either in front or behind it, in suitable guides, is arranged a regulating plate C adapted to be raised up and down, so that it may cover and uncover all or any number of the holes in the portion B. The vertical movement of this plate C may be effected in any suitable manner. The best way in which this can be done is automatically, and for this purpose I have herein indicated a clock-work mechanism D, connected suitably as by means of the line E with the top of the plate C. The lower portion of the front of the retort, that is the remaining portion, may be closed in any manner, as by means of a door, or as here shown by means of a sealed plate F.

The bottom of the retort is foraminous, and may consist of any suitably perforated or apertured plate, or other surface, in one or more pieces, and said retort is raised above the foundation so as to permit the entrance of air under it in any suitable way, as by means of the closed in side foundations G.

Through the open front of the retort, the fuel is inserted and ignited. The front is then closed in again, and at the time of ignition, the regulating plate C has been lifted up to its full height, therefore exposing all the holes or apertures in the front portion B.

The time mechanism is so set as to hold this plate up a certain length of time until that period of combustion is reached at which it is necessary to gradually diminish the inflow of air and then the clock mechanism begins to allow the plate to descend gradually. As the plate gradually covers the holes or apertures in the front portion B it cuts off more and more of the air inlet exposed, and gradually reduces the incoming air, according to the necessities of combustion within, until it finally cuts it all off. The air being thus admitted at proper times and in proper proportions, will mix with the gases resulting from the combustion of the fuel, and joining them within the arched area in the top of the retort, will pass backwardly over the rear wall and out into any suitable channel by which they may be conducted to the point at which they are to be used.

I have found, in practice, that the projecting rear end of the roof is of decided advantage in that by confining, to a certain extent, in conjunction with the rear wall, the escape of the gases, there is a tendency to effect a more thorough admixture of the air and the gases of combustion.

The retort may be placed in any position desirable for the particular purpose for which it is needed.

The advantage of having the holes in front portion B all over it, is that a better distribution of the entering air is effected.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A fuel gas retort consisting of a shell or casing supported upon closed in side foundations and comprising a foraminous bottom, vertical end walls and an arched roof said roof projecting at its rear end over and beyond the plane of the rear wall of the shell or casing so as to leave a clear roof space, and the upper portion of the front wall corresponding with the space inclosed by the roof being provided with openings, a vertically slidable regulating plate controlling said openings and having its opposite ends fitted to slide in vertical channels or guides in the sides of the upper portion of the front, a line connected with the plate and passing over direction pulleys and means whereby the vertical movement of the plate is automatically effected.

In witness whereof I have hereunto set my hand.

JOHN MARTIN.

Witnesses:
S. H. NOURSE,
H. F. ASCHECK.