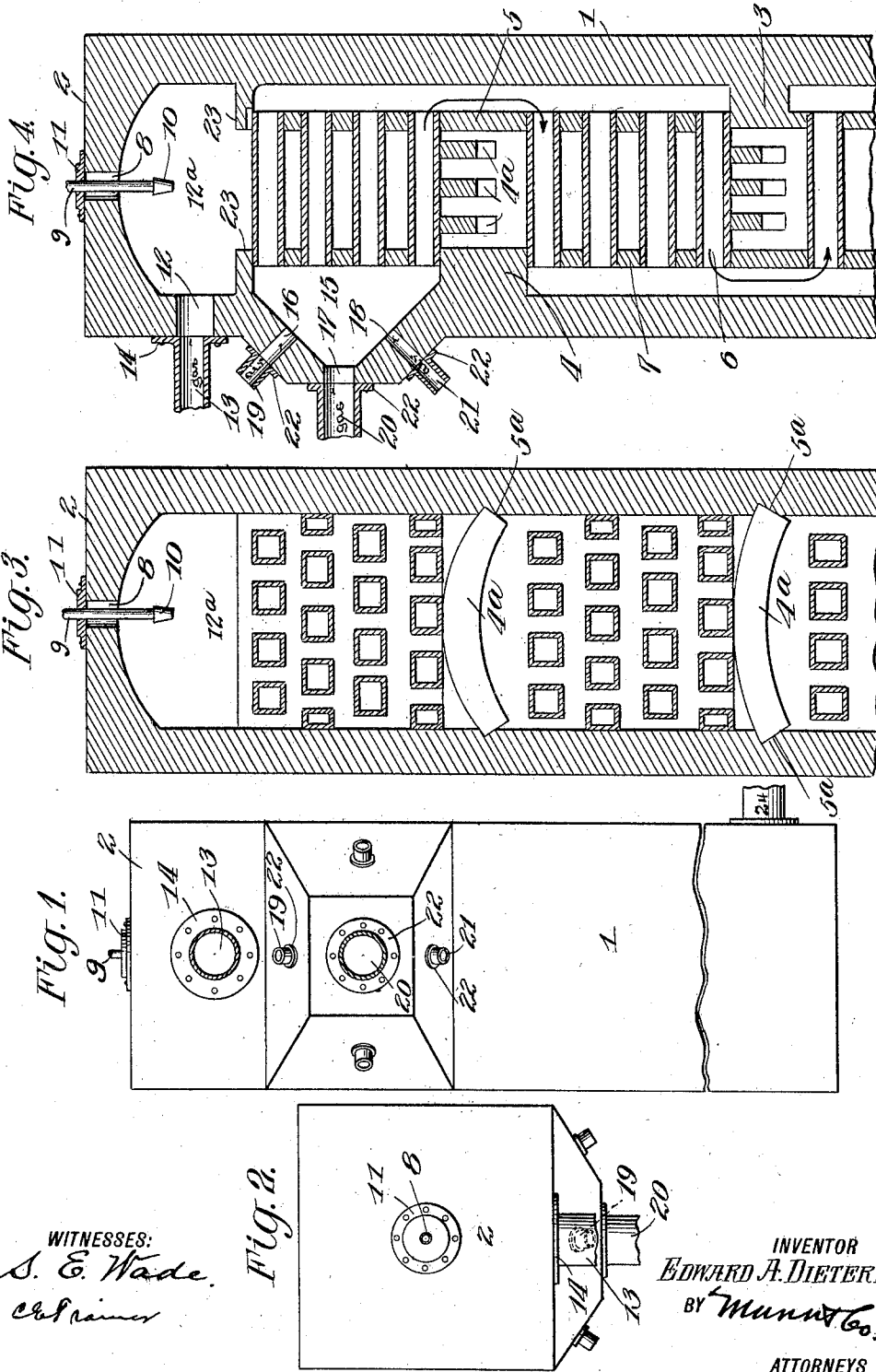


E. A. DIETERLE.
 APPARATUS FOR ENRICHING GAS.
 APPLICATION FILED MAY 26, 1910.

985,015.

Patented Feb. 21, 1911.



WITNESSES:
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR ENRICHING GAS.

985,015.

Specification of Letters Patent.

Patented Feb. 21, 1911.

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To all whom it may concern:

Be it known that I, EDWARD A. DIETERLE, a citizen of the United States, and a resident of Seattle, in the county of King and State of Washington, have made certain new and useful Improvements in Apparatus for Enriching Gas, of which the following is a specification.

My invention is an improvement in apparatus for enriching gas and consists in certain novel constructions and combinations of parts, hereinafter described and claimed.

The object of the invention is to provide a simple and efficient apparatus of the character specified for manufacturing gas of a high grade with a minimum of expense and continuously.

Referring to the drawings forming a part hereof, Figure 1 is a front view of the apparatus, Fig. 2 is a top plan view, Fig. 3 is a partial vertical transverse section, and Fig. 4 is a similar section at right angles to Fig. 3.

The present embodiment of the invention consists of a casing of suitable shape, size and material, but preferably rectangular in cross section, and of material having poor heat conducting qualities. The casing is closed at the top, and is supported in any suitable manner. The casing consists of side walls 1 and a closed top 2, and at suitably spaced intervals ledges 3 and 4 extend transversely of the casing, the alternate ledges 3 extending from the rear wall, and the intermediate ledges 4 from the front wall. Near the opposite wall of the casing a cross bar 5 is arranged, the upper face of the bar being in the same plane with the upper face of the ledge. The ledges and cross bars divide the casing into a plurality of sections, and a plurality of rows of hollow bricks is supported on each ledge and cross bar, the bricks of the lowermost row resting at one end on the ledge, and at the other on the cross bar, and intermediate their ends the bricks of the row are supported by arches 4^a arranged transversely of the casing in spaced relation, and seated at their ends in recesses 5^a in the side walls. The bricks are arranged in transverse superposed series, the members of each series being arranged parallel and spaced apart laterally, and the bricks are

spaced apart by interposed spacing blocks 7, arranged at right angles to the bricks 6. The bricks may be arranged in any desired or suitable manner, and are of any suitable material preferably fire clay.

An opening 8 is arranged in the top of the casing, and a pipe 9 extends vertically through the opening, and is provided at its inner end with a spraying device 10 of suitable form. A washer 11 encircles the pipe outside of the casing, and closes the opening. Adjacent to the opening 8, the front wall of the casing is provided with a lateral opening 12, and a pipe 13 is provided with a flange 14 encircling the opening, and secured to the outer wall of the casing.

It will be observed that the bricks do not extend to the top of the casing, leaving a vacant space forming a chamber 12^a, which will be hereinafter designated as the mixing chamber.

Below the opening 12, a chamber 15 hereinafter designated as the combustion chamber is formed in the front wall of the casing, and three openings 16, 17 and 18 are provided in the front wall, all communicating with the chamber 15. Pipes 19, 20 and 21 communicate with the respective openings, each pipe having a flange 22 encircling the opening, and secured to the casing.

The casing may be of any desired length, and is filled with the brick, and the members of each series are staggered with respect to the members of the adjacent series. The weight of all the bricks above them is not borne by the bricks, but only the weight of those below the next upper ledge and cross bar.

In operation, the casing is preferably connected with a plurality of water gas generators by the pipes 13 and 20. The arrangement is such, that either the chamber 12^a or 15 may be used as the combustion chamber and the other as the mixing chamber to make the operation continuous. As the gas enters through the pipe 20, it is mixed with a suitable quantity of air entering through the pipes 19 and 21, and burns in the chamber 15, the products of combustion passing downwardly in the casing through the bricks, thus thoroughly heating the same. Oil is sprayed over the bricks

from the pipe 8, and is mixed with water gas entering through the pipe 13 from the generators. The oil is injected continuously, and while the water gas from one generator is entering through the pipe 13, the other generator is being heated, the blast gases from which enter the combustion chamber 15 through the pipe 20. The oil will be thoroughly vaporized, and the water gas will be suitably enriched thereby.

An outlet pipe 25 is provided near the bottom of the casing, in order that the enriched gas may be drawn off, and conducted to a suitable place of storage. The oil and water gas are mixed under the most favorable conditions, the oil being vaporized, and the gas heated so that a large quantity of the products of the decomposed oil are taken up by the gas. It will be evident that any kind of gas might be used instead of water gas, the object of the invention being to produce a high grade gas, rich in light producing qualities.

In the normal operation of the apparatus the gas enters the chamber 15 through the pipe 20 and air is admitted through the pipes 19 and 21. It will be evident that the proceeding might be reversed, the products of combustion passing outside of the bricks and the oil and gas to be enriched passing through the bricks. The bricks separate the products of combustion from the gas to be enriched.

The separation of the casing into compartments by the ledges, and the arrangement of the bricks above each ledge, constrain the products of combustion to pass backward and forward from one side of the casing to the other, and the cross bars 5 are spaced apart from the adjacent wall of the casing, so that each compartment of the casing communicates with the next compartment below, between the cross bar and the casing wall.

The spacing apart of the arches 4^a, permits the free passage of the oil and enriched gas, and it will be observed that while the mixing chamber is separated from the products of combustion in the combustion chamber, yet the oil and gas is permitted to pass freely down between the bricks. The casing is in fact provided with a plurality of series of transverse parallel passages spaced apart from each other, the passages of each series communicating at one end with the passages of the series next above, and at the other with the passages of the series next below.

The combustion chamber communicates with the uppermost series of passages, and the mixing chamber is arranged above the passages and communicates with the space between the same. It will be understood

that the casing is provided with a suitable outlet for the products of combustion at its lower end.

It will be understood that the chamber 15 is designated as the combustion chamber and the chamber 12^a as the mixing chamber for convenience. In the actual operation of the apparatus, the said chambers are alternately mixing and combustion chambers.

I claim:

1. An apparatus of the character specified, comprising a casing provided near its lower end with an outlet and at spaced intervals with spaced series of transverse supports, hollow bricks arranged in superposed rows on the supports, the bricks being spaced apart in the rows, and the bricks of each row being staggered with respect to the bricks of the adjacent rows, spacing blocks between the bricks at the ends thereof, an oil inlet pipe extending through the top of the casing above the bricks and provided with a spraying device, a pipe for water gas opening into the casing above the bricks and below the oil pipe, the casing wall being recessed below the said pipes and at the ends of the bricks to form a combustion chamber, a gas inlet pipe opening into said chamber at approximately its center, an air inlet pipe opening into the chamber on each side of the gas inlet pipe, and outlet pipes near the bottom of the casing for the waste gases and for the enriched gases.

2. An apparatus of the character specified, comprising a casing provided at spaced intervals with spaced series of transverse supports, hollow bricks arranged in superposed rows on the supports, the bricks being spaced apart in the rows, and the bricks of each row being staggered with respect to the bricks of the adjacent rows, spacing blocks between the bricks at the ends thereof, an oil inlet pipe extending through the top of the casing above the bricks and provided with a spraying device, a pipe for water gas opening into the casing above the bricks and below the oil pipe, the casing wall being recessed below the said pipes and at the ends of the bricks, to form a combustion chamber, and the said chamber having gas and air inlets connecting therewith and having outlets for the waste gases and the enriched gases.

3. An apparatus of the character specified, comprising a casing provided at spaced intervals with spaced series of transverse supports, hollow bricks arranged in superposed rows on the supports, the bricks being spaced apart in the rows, and the bricks of each row being staggered with respect to the bricks of the adjacent rows, spacing blocks between the bricks at the ends thereof, an oil inlet pipe extending through the

top of the casing above the bricks and provided with a spraying device, a pipe for water gas opening into the casing above the bricks and below the oil pipe, the casing having a combustion chamber below the pipes, said chamber having gas and air inlets communicating therewith, the said casing having outlets for the enriched gases and for the waste gases.

4. An apparatus of the character specified, comprising a casing provided with transverse superposed rows of hollow bricks arranged in parallelism, spacing blocks between the ends of the bricks, the ends of the bricks being spaced from the inner wall of the casing, the blocks being arranged in series, each series communicating at one end with the series next above and at the other end with the series next below the casing having a mixing chamber above the bricks and communicating with the space between the same, and having a combustion chamber below the mixing chamber and communicating with the ends of the bricks, said casing having ledges extending inwardly in alternation from the opposite side walls, to constrain the products of combustion to pass backward and forward across the casing, the mixing chamber having oil and gas inlet ports, and the combustion chamber having gas and air inlet ports.

5. An apparatus of the character specified, comprising a casing provided with transverse superposed rows of hollow bricks arranged in parallelism, spacing blocks between the ends of the bricks, the ends of the bricks being spaced from the inner walls of the casing, the blocks being arranged in series, each series communicating at one end with the series next above and at the other end with the series next below the casing having a mixing chamber above the bricks and communicating with the space between the same, and having a combustion chamber below the mixing chamber and communicating with the ends of the bricks, said casing having ledges extending inwardly in alternation from the opposite side walls to constrain the products of combustion to pass backward and forward across the casing.

6. An apparatus of the character specified, comprising a casing provided with transverse superposed rows of hollow bricks arranged in parallelism, spacing blocks between the ends of the bricks, the ends of the bricks being spaced from the inner walls of the casing, the blocks being arranged in series, each series communicating at one end with the series next above and at the other end with the series next below the casing having a mixing chamber above the bricks and communicating with the space between the same, and having a combustion

chamber below the mixing chamber and communicating with the ends of the bricks, said casing having means for constraining the products of combustion to pass from side to side of the casing through the bricks.

7. An apparatus of the character specified, comprising a casing provided with transverse superposed rows of hollow bricks arranged in parallelism, spacing blocks between the ends of the bricks, the ends of the bricks being spaced from the inner walls of the casing, the blocks being arranged in series, each series communicating at one end with the series next above and at the other end with the series next below the casing having a mixing chamber above the bricks and communicating with the space between the same, and having a combustion chamber below the mixing chamber and communicating with the ends of the bricks.

8. An apparatus of the character specified, comprising a casing having a plurality of series of spaced transverse substantially parallel passages, the passages of each series communicating at one end with the series above and at the other with the series below, said casing having a combustion chamber at the ends of the uppermost series of passages, the chamber having gas and air inlet ports, the casing having a mixing chamber at its top communicating with the space between the passages and having gas and oil inlet ports, and a sprayer in connection with the oil inlet port.

9. An apparatus of the character specified, comprising a casing having a plurality of series of spaced transverse substantially parallel passages, the passages of each series communicating at one end with the series above and at the other with the series below, said casing having a combustion chamber at the ends of the uppermost series of passages, the chamber having gas and air inlet ports, the casing having a mixing chamber at its top communicating with the space between the passages and having gas and oil inlet ports.

10. An apparatus of the character specified, comprising a casing having a plurality of series of spaced transverse substantially parallel passages, the passages of each series communicating at one end with the series above and at the other with the series below, said casing having a combustion chamber provided with gas and air inlet ports, and a mixing chamber provided with gas and oil inlet ports, one of the chambers communicating with the space between the passages, and the chamber with the ends of the uppermost series of passages.

11. In an apparatus of the character specified, comprising a casing having a plurality of series of spaced transverse substantially

parallel passages, the passages of each series communicating at one end with the series above and at the other with the series below, said casing having a combustion chamber provided with gas and air inlet ports, and a mixing chamber provided with gas and oil inlet ports, one of the chambers

communicating with the space between the passages, and the other with the passages.

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Witnesses:

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