B. F. McKEE.

GAS GENERATOR.

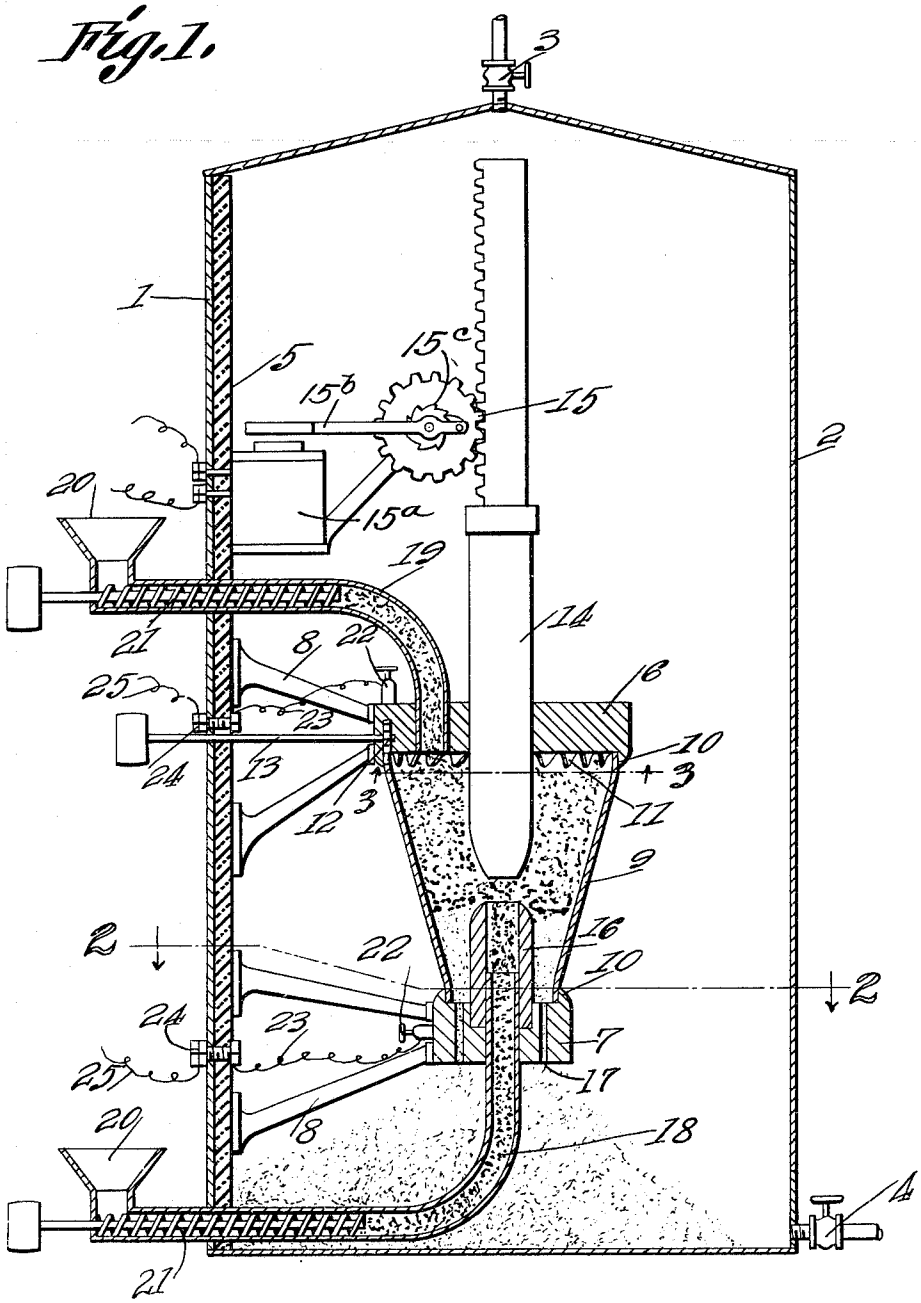
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2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

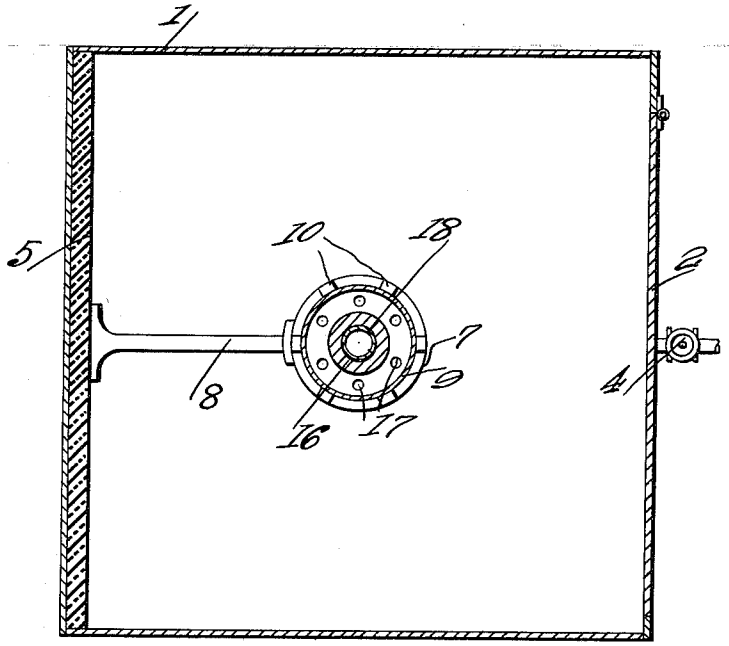
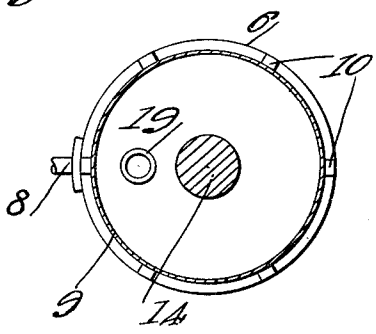


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

BEN F. McKEE, OF ARMA, KANSAS.

GAS-GENERATOR.

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To all whom it may concern:

Be it known that I, BEN F. McKEE, a citizen of the United States, residing at Arma, in the county of Crawford and State of Kansas, have invented a new and useful Gas-Generator, of which the following is a specification.

The present invention relates generally to the art of gas production, and aims to provide a novel and improved apparatus for producing gas from coal or other carbonaceous material.

Another object of the invention is the production of artificial gas by the employment of an electric arc as a source of heat.

A still further object of the invention is the provision of a gas generator having novel features of construction to enhance the efficiency and utility thereof.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical section of the generator, portions being shown in elevation.

Figs. 2 and 3 are horizontal sections taken on the section lines 2—2 and 3—3 of Fig. 1.

The apparatus embodies a suitable casing 1, preferably disposed upright, and having a door 2 for enabling access to be had to the interior working parts for purpose of repair, adjustment or replacement. The casing 1 incloses a gas chamber, and the casing is air tight to exclude air from said chamber. The casing has an upper valve controlled outlet 3 and a lower valve controlled outlet 4.

The working parts of the apparatus are supported from an upright slab 5 of insulating material and attached to the back wall of the casing at the interior thereof. Vertically spaced heads or blocks 6 and 7 are supported by brackets 8 attached to the slab 5, the upper head 6 being of larger diameter than the lower head 7. A frusto-conical or tapered retort hopper or drum 9 is disposed between and has its ends abutting the heads 6 and 7, the larger end member 9 being uppermost. The heads 6 and 7 have annular series of lugs 10 for holding the member 9 in position and permitting it to rotate about a vertical axis. The member 9 incloses the retort chamber, and the upper end of the member 9 is provided with an annular series of notches 11 for the outlet of the gas from the retort chamber into the gas chamber within the casing 1, and said notches also provide a crown gear meshing with a pinion 12 rotatable within the recess in the upper head 6 and secured to the inner end of a shaft 13 which is journaled in the head 6. The shaft 13 is journaled through the slab 5 and can be rotated in any suitable manner for imparting rotary movement to the member 9 during the operation of the generator.

An electric arc as a source of heat is produced within the retort chamber for driving the gas from the coal or carbonaceous material, and for this purpose, a carbon or other suitable electrode 14 is slidable through a central aperture in the upper head 6 and has its active end depending within the retort chamber, and any suitable controlling and feeding device 15 being used for adjusting the electrode 14 and feeding it downwardly to maintain the proper arc gap. The device 15 embodies an electro-magnet 15^a for attracting an armature 15^b, which is connected by suitable gearing 15^c with the electrode 14, to adjust the latter electrode magnetically as desired. Any suitable means for this purpose can be used. A lower electrode 16 of any suitable character is supported by the head 7, having its lower end seated in the recess in said head, and the electrode 16 is, as illustrated, of tubular form, whereby the carbonaceous material can be fed upwardly to the arc. The lower head 7 has an annular series of apertures or openings 17 leading downwardly from the retort chamber and providing outlets for the gravitation of the ashes onto the bottom of the casing, from which the ashes can be removed from time to time.

In order to feed the material up through the tubular electrode 16, a pipe 18 has its delivery terminal projecting upwardly through the head 7 and into the electrode 16, and a similar feed pipe 19 has one terminal extending downwardly through the upper

head 6 to deliver material into the upper portion of the retort chamber. The pipes 18 and 19 extend rearwardly through the slab 5 although they can be led into the casing in any suitable manner. The outer ends of the pipes 18 and 19 have hoppers 20 for receiving the material, and feed worms or screws 21 work within the pipes 18 and 19 to force the material into the retort chamber, said worms being operated in any suitable manner.

The current can be supplied to the electrodes in any suitable manner. As illustrated, binding posts 22 are carried by the heads 6 and 7 and are connected by leads 23 with binding posts 24 extending through the slab 5, to which the feed conductors 25 are connected.

In operation, the coal or other carbonaceous material is prepared by grinding it into dust, and washing the same in water. Before starting the generator, the air within the casing 1 must be driven therefrom to prevent the burning of the gas or an explosion in the generator. Thus, by placing a suitable amount of carbid in a receptacle of water in the bottom of the casing, and closing the door 2, the gas given off will rise to the upper portion of the casing, and by opening the outlet 4, the air will be driven downwardly through said outlet until the gas chamber is entirely rid of the air, in which event the outlet 4 is closed. The coal dust is then fed through the pipes 18 and 19 into the retort chamber, and when the electric current is allowed to flow between the electrodes, this will produce an arc having intense heat, thereby driving the gas from the coal dust. The gas flows through the notches 11 into the gas chamber, and is forced out through the upper outlet 3 which is opened for that purpose. The gas can be collected within a gasometer or tank wherein it can be stored and from which it can be withdrawn as used. The gas can be produced cheaply, and can be used for lighting and heating purposes generally. The coal dust which is fed to the arc from the pipe 18, passes longitudinally through the electrode 16 to the arc, and the coal dust which is fed into the upper portion of the retort chamber from the pipe 19 will gravitate to the zone of intense heat surrounding the arc, it being noted that the member 9 is rotated whereby to agitate the coal dust and render the operation thorough. The ashes drop around the electrode 16 and through the openings 17.

Having thus described the invention, what is claimed as new is:—

1. A gas generator embodying means for producing an electrically heated zone, means for feeding carbonaceous material to said zone, and means for rotating the material in said zone.

2. A gas generator embodying means for producing an electrically heated zone, means for feeding carbonaceous material to said zone, and means for agitating the material in said zone.

3. A gas generator embodying a pair of electrodes, means for feeding carbonaceous dust to the arc between said electrodes, and means for rotating the material around the arc.

4. A gas generator embodying a pair of electrodes, means for feeding carbonaceous dust to the arc between said electrodes, and means for agitating the dust adjacent to the arc.

5. A gas generator embodying a gas chamber and a retort chamber therein, means for feeding carbonaceous material into the retort chamber, and means for electrically heating the material within the retort chamber.

6. A gas generator embodying a pair of electrodes, a rotatable member surrounding them and providing a retort chamber, and means for feeding carbonaceous material into said member.

7. A gas generator embodying a movable member inclosing a retort chamber, means for producing a heat zone electrically within said member, and means for feeding carbonaceous material into said member.

8. A gas generator embodying a pair of heads, a rotatable member between them and inclosing a retort chamber, means for producing an electrically heated zone within said member, and means for feeding carbonaceous material through one of said heads.

9. A gas generator embodying a pair of heads, a rotatable member therebetween and providing a retort chamber, electrodes projecting into said chamber from said heads, and means for feeding carbonaceous material through one of said heads into said chamber.

10. A gas generator embodying a pair of electrodes, one being tubular, means for feeding carbonaceous material through said tubular electrode, and means for agitating the material delivered from said tubular electrode.

11. A gas generator embodying vertically spaced heads, and a rotatable member between them and having gas outlet means at its upper end, and electrodes projecting from said heads within said member, the lower head having means for the outlet of ashes, and means for feeding carbonaceous material through one of said heads into said member.

12. A gas generator embodying vertically spaced heads, a tapered retort drum having its ends abutting said heads and its larger end uppermost, electrodes projecting from said heads within said drum, the lower head having an ash outlet, means for feeding car-

bonaceous material through one of said heads to the arc between the electrodes, the upper end of the drum being notched for the outlet of gas and providing gear teeth, and a pinion assembled with the upper head meshing with the gear teeth for rotating the drum.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

BEN F. McKEE.

Witnesses:
JAMES ASHER,
JOHN JUMET.