Feb. 15, 1938. H. DERINGER 2,108,764

GAS PRODUCER

Filed March 2, 1937

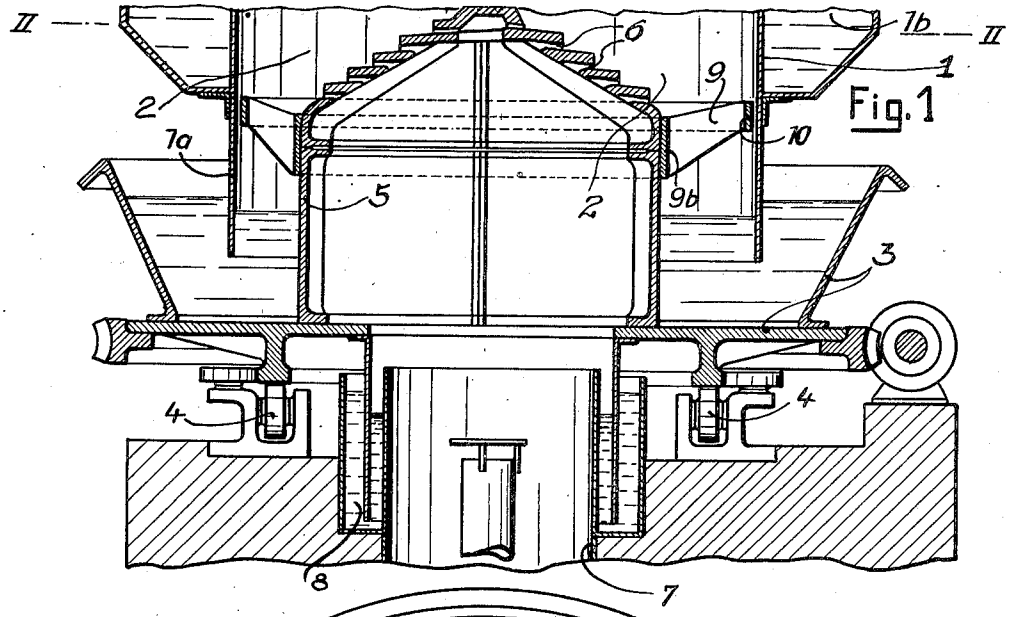


Fig. 1

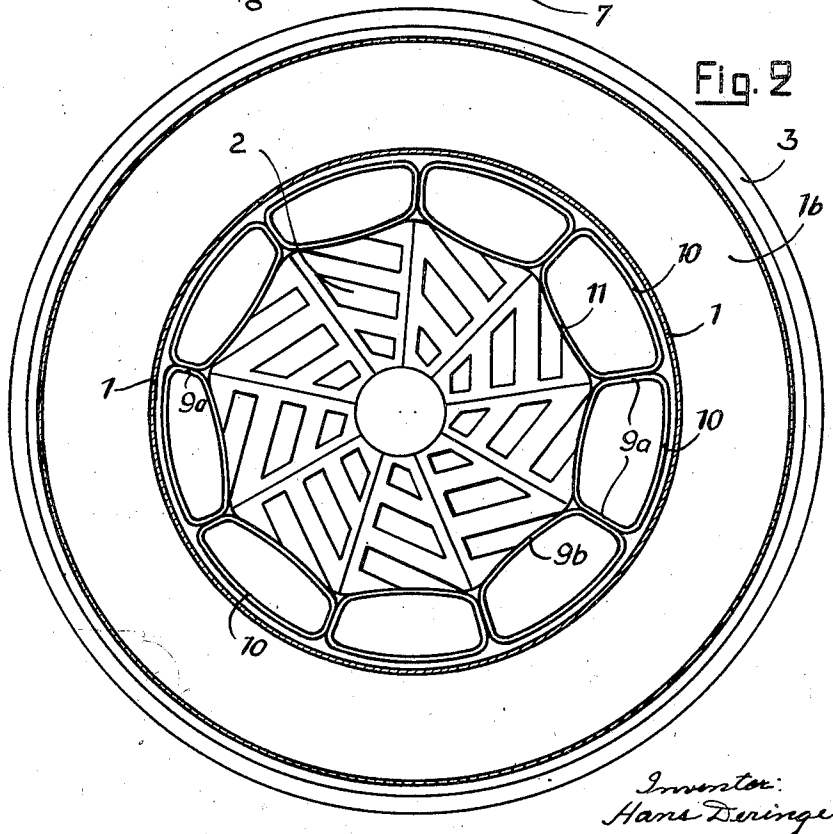


Fig. 2

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GAS PRODUCER

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4 Claims. (Cl. 126—182)

The invention relates to gas producers, provided with a revolving grate and with means for withdrawing the residue through an annular space provided between the grate and the wall of the producer shaft, said grate reaching into shaft of the gas producer and being provided with suitable openings for introducing air and/or steam into the charge.

In such well-known gas producers, an unequal burning of the fuel can often be observed in the producer shaft. Now I have found that in most instances this unequal burning is due to the fact, that the fuel charge of the gas producer in zones near the grate, situated within the range of the circular or polygonal grate, which may be arranged centrally or eccentrically on the ash pan, is shaken by the movement of the grate and this causes the material to be more closely packed together near the central grate than in the zones near the shell. On the other hand, in the zones of the fuel bed, adjacent to the shaft wall, where the revolving of the grate does not effect a close packing together of the fuel, the charge becomes loosened by the extraction of the ash. Therefore, the density of the charge throughout the shaft is very unequal when the producer is in operation and consequently the gasifying media, such as air and steam, are not uniformly distributed within the gas producer shaft. In the less closely packed zones of the fuel, these media meet a comparatively low resistance, and therefore the main quantity of the gasifying medium flows into the fuel through these outer zones, whilst the middle and denser zone of the charge is traversed by the gasifying media only in insufficient quantities.

The main object of my present invention is to overcome the difficulties arising from such unequal distribution of gasifying media in a gas producer and to provide such improvements which will ensure a uniform flow of gases throughout the whole area of the producer shaft, thus increasing the capacity of the gas producer and facilitating the operation of same.

The invention consists principally in the provision of substantially vertically or upwardly disposed vanes, paddles, or ash agitating members in the grate of the gas producers, which project into the annular space between the shaft and the grate radially or approximately radially, which are rotated together with the grate.

If the revolving grate of the producer is constructed in the above described manner, the material in the annular space around the grate is rotated together with the grate, approximately up to the zone near the upper side of the grate. The fuel bed is therefore not only shaken and packed together just above the grate, but the material in the outer zones between the partition walls is also rotated together with the grate and is consequently packed together. As the charge throughout the whole area of the shaft is acted upon by such rotation, the whole fuel bed will be packed quite uniformly and a correspondingly equal distribution of media may be attained.

Preferably, the radial partition walls according to the invention extend only partly over the height of the annular space between the grate and the shaft wall.

A still further feature of my invention consists in that the radial partition walls are built as projections of the grate and are fixed to its peripheral portions which project into the shaft.

Finally, the outer ends of the radial partition walls, according to my invention, are firmly interconnected by suitable means, for instance webs, arranged annularly.

Further objects and advantages of my invention will be in part obvious and in part specifically pointed out in the description contained hereinafter which, when taken in conjunction with the accompanying drawing, discloses a preferred embodiment thereof. Such embodiment, however, is to be considered merely as illustrative of the principles of the invention.

In the drawing, Figure 1 is a vertical section through the lower part of a gas producer, constructed according to my invention, and Figure 2 shows a horizontal section taken on line II—II of Figure 1.

The drawing illustrates the substantially cylindrical wall 1 of the shaft 2 of the gas producer, which is surrounded on the outside by a cooling jacket shell 1b for the reception of water or of any other suitable cooling liquid. The upper part of the gas producer which for simplicity's sake has not been shown on the drawing, can, however, be designed in any desired way, known to those skilled in the art. An ash pan 3 suitable for the reception of water and supported from rollers 4, revolving about the center line of the gas producer, is arranged underneath the shaft 2. The lower end 1a of the shell projects into the ash pan.

The grate 5 is situated above the ash pan 3 and as shown on the drawing, the grate has a polygonal shape and is arranged eccentrically to the center of the ash pan. The grate rotates together with the ash pan. Since the grate is arranged eccentrically, the distance between the

revolving grate and the wall of the shaft is altered, while the grate is revolving, so that the material lying between the grate and the gas producer wall 1 is squashed and crushed. Openings 6 are provided in the upper conical part of the grate for the supply of the gasifying media, such as air and/or steam. The gasifying media are introduced into the space surrounded by the grate, through the pipeline 7, which terminates underneath the grate 5 and which is sealed from the atmospheric air by means of a submerged closure 8.

The grate 5, preferably at the level of the passage from the cylindrical part into the conical part is fitted with radial partition walls 9, projecting through the space between the side wall of the shaft and the side of the grate. As may be seen from the drawing, the upper edge of the partition wall 9 is situated approximately in the zone of the conical part of the grate, whereas the partition walls terminate at their lower part such a distance from the ash pan, that the removal of ash or of slag lumps and the crushing of the latter by the sides of the eccentric grate are not hindered.

The outer ends of the partition walls 9 are interconnected by webs 10, which together form a circle; this circle is arranged centrally inside the shaft shell, coming very near to the shell, and rotates together with the grate and the partition walls 9, fastened to the grate.

When carrying out my invention as illustrated on the drawing, the radial partition walls are formed by annular bodies, the narrow sides 9*a* of which rest against each other and are fastened at one longitudinal side 9*b*, by means of screws or in any other suitable way, to the grate 5.

The drawing shows only for the purpose of exemplification a preferred form and manner in which the invention may be embodied and practiced. Instead of building-in an ash pan, it is also possible to provide a so-called lower ash extractor. The shape of the grate may likewise be different.

I have now described my present invention on the lines of a preferred embodiment thereof, but my invention is not limited in all its aspects to the mode of carrying it out as described and shown, since the invention may be variously embodied within the scope of the following claims.

I claim:—

1. A gas producer comprising a shell, a rotary grate and a rotary ash extractor tray annularly surrounding the grate disposed at the bottom of said shell, said tray projecting under the shell in vertically spaced relation therewith and said grate comprising a lower tubular conduit and an upper conical gas diffusion grid therefor arranged within the bottom of the shell in spaced relation therewith so as to leave an annular crushing space between the periphery of the tubular conduit and the shell for crushing of ash during descent therethrough to said tray, and a plurality of radially extending ash agitating members in an annular series mounted for rotation in the space between the periphery of the tubular conduit and the shell, said radially extending ash agitating members being annularly spaced from each other and extending from the periphery of the tubular conduit to near the shell wall.

2. A gas producer as claimed in claim 1, and in which the radial ash agitating members extend only part of the height of the annular ash space and terminate at their lower parts above the bottom edge of the shell.

3. A gas producer as claimed in claim 1, and in which the radial agitating members are fastened to the grate for rotation thereby near the juncture of the gas diffusion grid with the tubular conduit, and in which the members terminate at their lower parts above the lower extremity of the shell so as to leave a portion of the periphery of the tubular conduit open for cooperative ash crushing action with the shell below the radial members and above the lower extremity of the shell.

4. A gas producer as claimed in claim 1, and in which the radial agitating members are rigidly interconnected with each other at their outer parts by web means together forming substantially an annulus.

HANS DERINGER.