Sept. 26, 1933. P. VAN ACKEREN 1,928,609

GAS PRODUCER

Filed March 30, 1931

FIG. 1.

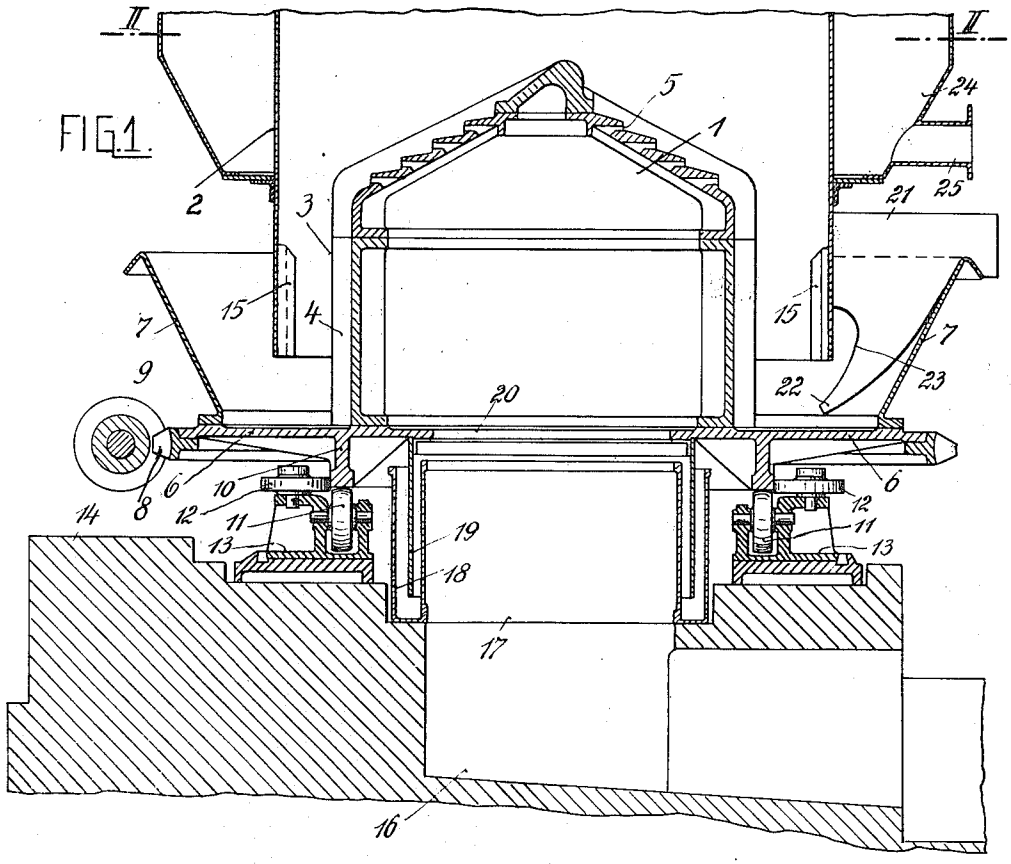
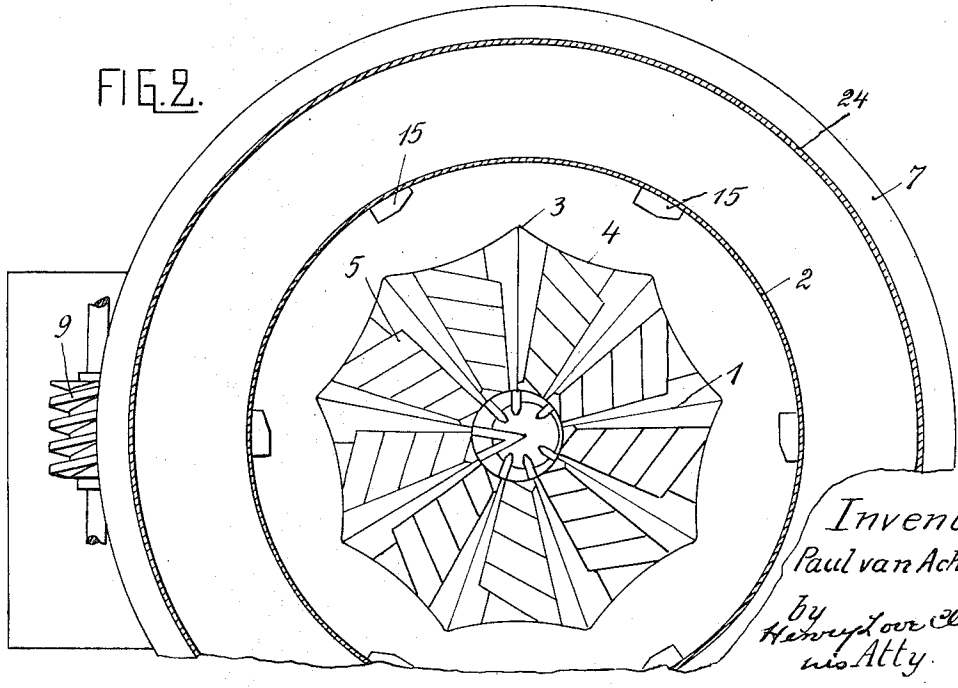


FIG. 2.



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GAS PRODUCER

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Application March 30, 1931, Serial No. 526,182, and in Germany May 15, 1930

5 Claims. (Cl. 48—66)

My invention relates to gas producers and more particularly to producers having rotary grates.

It is an object of my invention to improve a producer of this type with a view to preventing one-sided accumulation of slag in the producer which may cause a breaking through the fire, thereby reducing not only the efficiency of the producer but also, in producers having water jackets, interfering with the heating of the water in the jacket.

To this end I combine with a polygonal rotary grate breaking members or jaws on the shell of the producer.

Preferably the members or jaws are distributed uniformly, and preferably the grate is arranged eccentrically to the producer axis.

The handling of one-sided slag accumulations is extremely troublesome. The producer must be shut down and the slag removed from the ash tray by hand. Lumps of slag which are thicker than the clearance between the lower end of the generator shell and the bottom of the ash tray and stick in the generator must be broken up by hand.

Accumulation of slag is principally due to two causes: Firstly to clogging by unduly large lumps of slag, and secondly the usual unsuitable shape of the discharge chute which normally occupies the entire width of the ash tray intermediate the lower end of the producer shell and the sides of the tray.

It is another object of my invention to provide a discharge tube which will not give trouble. To this end I cut away the edge of the chute which faces the producer shell so that it will not interfere with the sloping of the slag discharged from the shell and large lumps will not get jammed between the chute and the sloping slag.

It has already been suggested to shorten the chute vertically but this does not prevent slag accumulation.

A producer according to my invention is equipped with a rotary grate which has alternately projecting and receding portions and may be arranged concentrically or eccentrically to the producer shell. Breaking members are arranged on the inner wall of the shell for cooperation with the grate. The size of the grate in relation to the inside diameter of the shell is so determined that the smallest clearance between the projections, or, if desired, the receding portions of the grate, and the shell is smaller than the clearance between the lower end of the shell in the bottom of the ash tray, so that the lumps which are so small as to pass through the smallest clearance in the producer, will move without difficulty through the clearance at the ash tray.

In the drawing affixed to this specification and forming part thereof the base portion of a producer designed in accordance with my invention is illustrated diagrammatically by way of example.

In the drawing:

Fig. 1 is an axial section of the producer and

Fig. 2 is a section on the line II—II in Fig. 1.

Referring to the drawing, 1 is a polygonal hollow grate, which in the example illustrated is arranged eccentrically to the axis of the producer shell 2. As best seen in Fig. 2, the grate is polygonal, with projecting corners 3 and receding portions 4 intermediate the corners. The bays between the corners at the top of the grate are equipped with tuyères 5 arranged in stepped relation on the slopes of the bays. 6 is an ash tray having a horizontal bottom on which the grate 1 is mounted, above an orifice 20, and an inclined side wall 7. The lower end of the producer shell 2 projects into the ash tray, with its edge pitched above the bottom of the ash tray at the distance specified above. 8 is a worm wheel which surrounds the bottom of the ash tray, and 9 is a worm which imparts rotation to the wheel 8, the ash tray and the grate 1.

10 is a circular track projecting downwardly from the bottom plate of the ash tray and 11 and 12 are vertical and horizontal rollers in suitable bearing blocks 13 on the foundation 14 of the producer. The track 10 and its vertical and horizontal roller bearings are arranged in concentric relation to the axis of the producer shell 2, while the grate 1, as mentioned above, is arranged eccentrically to this axis of the producer shell and to the axis of the roller bearings. 15 are breaking members on the inner face of the shell 2 opposite the grate 1.

16 is a passage in the foundation 14 through which air is supplied to the space within the grate 1, 17 being a vertical pipe connected to the passage 16, 18 being a water tank surrounding the pipe, and 19 being an annular partition which is secured to the bottom of the ash tray 7 around the orifice 20 and dips into the tank 18. The means for admixing steam to the air are not illustrated. The mixture of air and steam is admitted to the charge through the tuyères 5.

21 is a discharge chute which is secured to the shell 2 and extends into the space between the lower end of the shell 2 and the wall of the tray. The chute projects with its pointed end 22 near the bottom of the tray and is cut away at the side

facing the shell 2 at 23 so as not to interfere with the slag which is discharged from the producer and forms a slope extending from the lower end of the shell to the wall of the ash tray.

24 is a water jacket surrounding the shell 2, and 25 is a pipe which connects the jacket to a supply of cooling water which circulates in the jacket, being heated therein.

In operation the tray 7 with the grate 1 is rotated by the wall 9 and the worm wheel 8. The slag gradually descends as the grate is rotated. Larger blocks will normally form in the oxidation zone above the grate 1, and will descend at the points of maximum cross sectional area intermediate the shell and the receding portions 4 of the grate. The blocks move on with the grate and finally encounter breaking members 15 whereby they are crushed. Crushing is rendered more effective by the eccentric arrangement of the grate illustrated, but such arrangement is not indispensible. Experience has shown, that the normal cutting members arranged below the lower end of the shell do not operate satisfactorily. In contradistinction thereto the crushing action resulting from the cooperation of the polygonal grate which may be eccentric or not, with the breaking members 15, is very efficient.

By cutting away the inner edge 23 of the chute 21 as shown, the sloping of the slag from the lower edge of the shell 2 is not interfered with, and lumps are not jammed between the slope and the edge of the chute.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

In the claims affixed to this specification no selection of any particular modification of the invention is intended to the exclusion of other modifications thereof and the right to subsequently make claim to any modification not covered by these claims is expressly reserved.

I claim:

1. A gas producer comprising a shell, a rotary grate having alternately projecting and inwardly curved receding side portions in said shell, and breaking members, also in said shell, arranged to cooperate with said grate, the face of each receding portion between each two projecting portions being graduated toward and meeting the outer portions of the projecting portions, whereby to effect by the rotary movement of the grate a gradual increase in crushing pressure on the ash and clinker and a working of the same outwardly toward the producer shell.

2. A gas producer comprising a shell, a rotary grate having alternately projecting and inwardly curved receding side portions arranged eccentrically in said shell and breaking members, also in said shell, arranged to cooperate with said grate, the face of each receding portion between each two projecting portions being graduated toward and meeting the outer portions of the projecting portions, whereby to effect by the rotary movement of the grate a gradual increase in crushing pressure on the ash and clinker and a working of the same outwardly toward the producer shell.

3. A gas producer comprising a shell, a rotary grate having alternately projecting and inwardly curved receding side portions in said shell, and breaking members, also in said shell, arranged to cooperate with said grate, the size of said grate being so determined that the minimum distance between said projecting portions and said shell is less than the distance between the lower end of said shell and the bottom of said tray, the face of each receding portion between each two projecting portions being graduated toward and meeting the outer portions of the projecting portions, whereby to effect by the rotary movement of the grate a gradual increase in crushing pressure on the ash and clinker and a working of the same outwardly toward the producer shell.

4. A gas producer comprising a shell, a rotary grate having alternately projecting and inwardly curved receding side portions in said shell, and breaking members, also in said shell, arranged to cooperate with said grate, the size of said grate being so determined that the minimum distance between said receding portions and said shell is less than the distance between the lower end of said shell and the bottom of said tray, the face of each receding portion between each two projecting portions being graduated toward and meeting the outer portions of the projecting portions, whereby to effect by the rotary movement of the grate a gradual increase in crushing pressure on the ash and clinker and a working of the same outwardly toward the producer shell.

5. A gas producer comprising a shell, a rotary grate having alternately projecting and inwardly curved receding side portions in said shell, breaking members, also in said shell, arranged to cooperate with said grate, and a discharge chute in the space between said shell and said tray, the upwardly extending edge of said chute, which faces said shell extending on the outer side of the shell from above the lower edge thereof down to and terminating substantially directly beneath said lower edge and being formed so as to provide a mound accumulating space between both the side and the bottom edge of the shell and said facing edge so as not to interfere with the sloping of the slag discharged from said shell.

PAUL VAN ACKEREN.