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GAS PRODUCER

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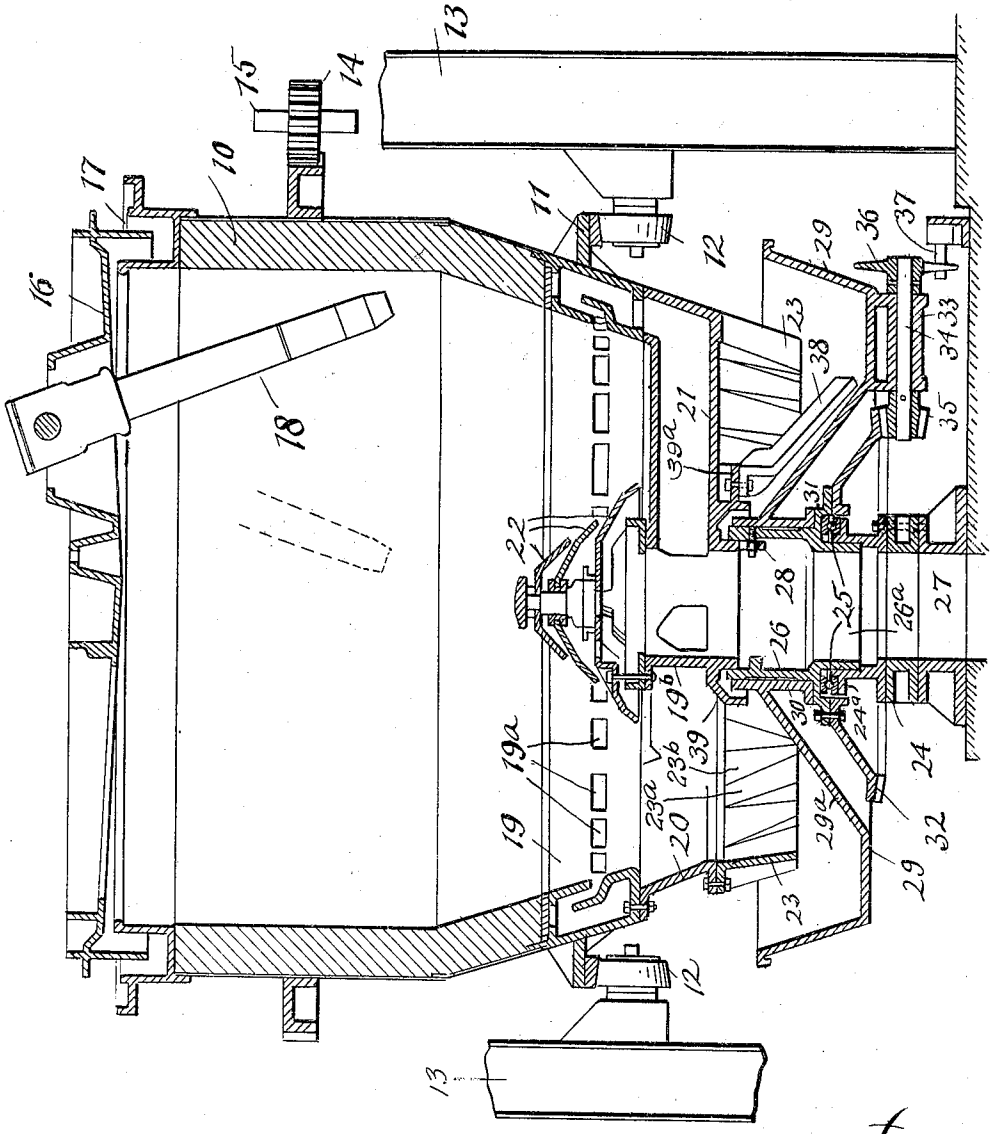

Inventor:
John F. Rogers
by
Thurston Kivett Hudson
attys

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UNITED STATES PATENT OFFICE

JOHN F. ROGERS, OF CLEVELAND HEIGHTS, OHIO, ASSIGNOR TO THE WELLMAN ENGINEERING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

GAS PRODUCER

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This invention relates to gas producers, and in certain respects is an improvement over the construction shown in my Patent No. 1,572,040, granted February 9, 1926.

In that patent I have shown a gas producer with a rotatable body portion which is supported from below, and with the ash-pan journaled on the lower central tubular support of the producer body, and though the ash-pan is normally caused to rotate with the producer body by the column of ashes extending from the latter into the pan, provision is made for automatically and at intervals causing the pan to rotate at a different speed than the producer body so that the column of ashes is forced downward by the relative movement between the producer body and ash-pan, causing a disintegration of the clinkers, and preventing to a large degree the formation of pipes or channels within the fuel.

With the invention constituting the subject matter of the present application, the ash-pan is actuated in a manner similar to that briefly referred to above, and the same results as regards the downward feed of the column of ashes and disintegration of clinkers is obtained, but in a more satisfactory manner. Further the invention involves certain differences and improvements in the construction, especially in the manner of supporting and actuating the ash-pan.

The invention may be briefly summarized as consisting in certain novel details of construction, and combinations and arrangements of parts which will be described in the specification and pointed out in the appended claims.

The figure of the drawings is a vertical sectional view of a gas producer having one embodiment of my invention which operates very satisfactorily and with high efficiency.

In the drawings, 10 represents the rotary body or shell of the producer which is supported on a plane above the ash-pan through the medium of a horizontal or substantially horizontal track 11 which rests and turns on supporting rollers 12 carried by stationary columns 13, there being preferably three of the latter and three of the rollers 12, although only two are shown.

Any suitable means may be provided for rotating the producer body, but in this instance this is accomplished by a pinion 14, mounted on a vertical shaft 15 and adapted to be driven by any suitable mechanism, not shown. At the top of the producer body there is a stationary cover 16, there being the usual water seal 17 between the cover and the upper part of the producer body. The cover is generally provided with fuel feed mechanism, and suitable means will be provided for operating a poker such as indicated at 18, but as the invention does not reside in these parts they are not illustrated.

At the lower part of the producer body there is an annular blast ring 19, and beneath this blast ring and secured to it there is a blast delivery member in the nature of a spider having a central hollow hub 19*b*, an outer flange ring 20, and a number of hollow arms 21, generally three in number by which air, steam, or both are delivered from the central hub 19*b* to the blast ring 19, and from the latter through suitable ports 19*a* into the fuel. At the top of the hub, and secured thereto are the usual blast hoods 22.

Depending from the peripheral or annular portion 20 of the spider there is an inwardly tapered flange or skirt 23 which extends down into the ash-pan, presently to be referred to, this flange or skirt being preferably composed of arc-shaped segments and being corrugated or composed of angularly disposed intersecting flat faces 23*a* and 23*b* which have an important function in forcing the column of ashes downwardly and breaking up the clinkers, when a relative movement takes place between the producer body and the ash-pan, the ring 20 and skirt 23 forming the lower end portion of the wall of the producer body.

Some distance below the producer body there is a hollow stationary base 24, composed in this instance of several members, although this is not material to the present invention, and rotatably supported on the bearing support 24*a* at the top of this base through the medium of ball bearings 25, there is a casting

in the form of a sleeve 26, the lower portion of which has a flange fitting into the bearing supporting part 24*a* of the base, and the upper part fitting around the flanged lower portion of the spider hub 19*b* so as to form with the hollow base 24 a vertical conduit 27 through which there may be supplied to the blast delivery member composed of the ring 20, arms 21 and hood 22, air, steam, or both, as is customary in the operation of gas producers. It will be observed that there is a hook or latch 28 extending from the spider hub 19*b* into the sleeve, and this causes the sleeve 26 to rotate with the spider and with the producer body, though the sleeve is supported independently of the spider hub on the bearing support 24*a* of the base 24.

The ash-pan indicated by the numeral 29 is positioned below the producer body and mounted on the vertical conduit 27, which conduit connects with the blast delivery member and forms a part of the blast delivery means. This ash-pan has a central hub or sleeve-like portion 30 which fits about the sleeve 26, and at the bottom it has a flange which rests upon the flanged lower portion 31 of the sleeve 26 so as to be supported by it, the hub 30 of the ash-pan being normally movable with the sleeve 26 but capable of relative rotation with respect thereto.

Thus it will be seen that the producer body is supported wholly independently of the lower structure including the ash-pan and the parts associated with it, and that the ash-pan is supported independently of the producer body on the sleeve 26 which rotates with the producer body, but is supported on the stationary base beneath it. Due to the fact that the ash-pan is supported on the rotating sleeve 26, and due to the column of ashes which normally extends downward from the producer body into the ash-pan, the ash-pan tends to, and normally does rotate with the producer body and at the same rate as the latter.

To cause the ash-pan to rotate at predetermined regularly occurring intervals at a different speed than the producer body, I secure to the lower flanged portion 31 of the sleeve 26, a bevel gear 32 which extends downwardly and outwardly from the flange 31, and I mount in a boss 33 on the bottom of the ash-pan 29 a rotary horizontal shaft 34 having at its inner end a relatively small bevel pinion 35 which engages the gear 32, and having at its outer end a star wheel 36. This star wheel is adapted to engage and to be rotated by stationary pins 37, one of which is shown in the drawing, and a number of which will be mounted about the producer in the path of movement of the star wheel so that as the producer is rotated, at intervals depending upon the number of pins 37 (the number can be varied to suit the requirements) the star wheel will be turned, causing the small pinion 35 to turn on the relatively large gear 32, and therefore causing the ash-pan to turn at a different rate than does the producer body and the sleeve 26 for the period that the star wheel is being turned. That is to say, while the star wheel is traveling from one pin 37 to the next, the ash-pan will turn with, or at the same rate as the producer body, and each time the star wheel engages and is turned by one of the pins 37, the movement of the ash-pan is automatically slowed down, though it will continue to move in the same direction that the producer body is moving. When this occurs, the column of ashes is crowded downward beneath the tapered flange or skirt 23 at the lower part of the producer body, and due to the corrugations or relatively inclined portions of this flange the clinkers are disintegrated as explained in my prior patent above referred to.

In order to provide a positive means for breaking up clinkers and preventing any hanging of the ash bed, I provide one or more ash engaging members or plows 38 which extend inside the flange 23 and are so disposed as to extend into the space inside of the flange 23 and into the ash pan space. In this case I have shown only one such ash engaging member, but more than one may be provided if desired. Preferably this ash engaging member or plow 38 is secured to a projection 39*a* on a flange 39 which extends outwardly and downwardly over the upper portion of the sleeve 26 and the hub 30 of the ash pan. The ash engaging member or members, as the case may be, will upon relative rotation between the ash pan and the ash engaging member, positively break up clinkers and prevent hanging of the bed of ashes. It will be obvious that the same effect may be obtained if the ash engaging member or members, such as that indicated at 38, is mounted upon the ash pan. This is true because results are obtained by virtue of a relative rotation between the ash engaging member and the portion of the bed of ashes which it is desired to break up and thereby assist in its downward flow into the ash pan from which it is removed by a suitable plow.

Generally a suitable plow, not shown, will be utilized to cause the delivery of the ashes from the ash-pan as it is rotated.

I believe it is novel with me to provide in a gas producer, an ash-pan support such as herein illustrated, and the various features of this novel construction I wish to cover in the appended claims not only with, but also independently of the mechanism by which the pan is at intervals automatically caused to be rotated at a different speed relative to the speed of the producer body.

I do not desire to be confined to the exact details or arrangements of parts herein shown, but aim in my claims to cover all modifications which do not involve a departure

from the spirit and scope of my invention as defined in the appended claims.

I wish it to be understood that where in the claims I have included a "producer body" this term is to be understood as referring to the producer body proper, and including the lower portion or skirt or, in other words, the producer body and the parts that are appendages thereto.

Having described my invention, I claim:

1. In a gas producer, a rotatable producer body, an ash-pan beneath the body, means outside the producer structure for supporting the said producer body above the ash-pan, a central tubular blast conveying means extending up in the rotatable producer body from beneath the same, and having the upper portion thereof connected to the rotatable producer body to rotate therewith, said ash-pan being rotatably supported on said portion of the tubular means which rotates with the rotatable producer body.

2. In a gas producer, a rotatable producer body, means for rotatably supporting the latter, means for rotating said body, a member coaxial with the lower portion of the producer body, independent means for rotatably supporting said member, means connecting said member to the producer body to be rotated thereby, an ash-pan mounted on said member, said ash-pan being normally rotatable with said member but so mounted on said member as to be capable of rotative movement relative thereto, and means acting automatically and at intervals on said ash-pan to impart turning movements thereto relative to said member and producer body.

3. In a gas producer, a producer body, means for rotatably supporting said body, means for rotating said body, a fixed supporting member positioned axially with respect to said body, a second supporting member rotatably mounted upon said first supporting member, an ash-pan beneath said body and rotatably mounted on said second supporting member, and means connecting said second supporting member with said producer body to be rotated thereby.

4. In a gas producer, a producer body, means for rotatably supporting said body, means for rotating said body, a fixed supporting member positioned axially with respect to said body, a second supporting member rotatably mounted upon said first supporting member, an ash-pan beneath said body and rotatably mounted on said second supporting member, means connecting said second supporting member with the producer body to be rotated thereby, and means acting automatically and at intervals upon said ash-pan to cause the same to turn relatively to the producer body.

5. In a gas producer, a producer body, means for rotatably supporting said body, blast delivery means comprising a blast delivery member carried by the producer body in the lower portion thereof and rotating therewith, an upright fixed tubular blast conduit member beneath said blast delivery member, and an intermediate tubular blast conducting member connecting said fixed tubular member and blast delivery member, said intermediate member being rotatably supported on said fixed tubular member and connected with the blast delivery member to rotate therewith, and an ash-pan mounted on said intermediate member, said ash-pan being capable of rotating with said producer body or at a speed different from that of the producer body.

6. In a gas producer, a producer body, means for rotatably supporting said body, blast delivery means comprising a blast delivery member carried by the producer body in the lower portion thereof and rotating therewith, an upright fixed tubular blast conduit member beneath said blast delivery member, an intermediate tubular blast conducting member connecting said fixed tubular member and blast delivery member, said intermediate member being rotatably supported on said fixed tubular member and connected with the blast delivery member to rotate therewith, an ash-pan rotatably mounted on said intermediate member and adapted to normally turn with the producer body, and means for intermittently causing the ash-pan to have a turning movement relatively to the producer body.

7. In a gas producer, a rotatable producer body, an ash-pan beneath the same and adapted to normally rotate therewith, said producer body having at the bottom thereof an annular skirt extending down into the ash-pan, means for periodically causing a variation in the rotative speeds of the producer body and ash-pan, and means rotatable with the producer body and inside said annular skirt for causing the column of ashes extending between the producer body and pan to be forced downward beneath said annular skirt when the producer body and pan are rotated at different speeds.

8. In a gas producer, a rotatable producer body member and a rotatable ash-pan member, means for mounting the body and ash-pan members, one ash plow mounted so as to extend into the space within the lower part of the body member and the ash-pan member, means for effecting rotary movement of the body member, the ash-pan member and said ash plow, and means for causing at intervals relative rotation between one of said members and the said ash plow.

9. In a gas producer, a rotatable producer body member and a rotatable ash-pan member, means for mounting the body member and the ash-pan member, an ash plow mounted so as to extend into the space within the lower part of the body member and ash-pan

member, means for effecting rotary movement of the body member the ash-pan member and said ash plow, and means for automatically and periodically causing relative rotation between one of said members and said ash plow.

10. In a gas producer, a rotatable producer body member, a rotatable ash-pan member, an ash plow mounted so as to extend into the space within the lower part of the body member and the ash-pan member, means for effecting normally simultaneous rotation of said members and the ash plow, and means for causing at intervals a relative rotation between one of said members and said ash plow.

11. In a gas producer, a rotatable producer body member and a rotatable ash-pan member, means for mounting the said members, means for causing rotary movement of the said members, an ash plow mounted upon one of said members and extending into the space within the lower part of the body member and the ash-pan member, the member upon which the ash plow is not mounted periodically having movement relative to the said ash plow.

12. In a gas producer, a rotatable producer body, a rotatable member arranged concentrically with said body and directly connected thereto for rotation therewith at the same rate of speed, means for rotatably supporting said body and said member, an ash-pan concentrically supported upon said member for rotation independently of the producer body, said ash-pan being normally rotatable with said member at the same speed, and means for rotating the ash-pan relatively with respect to said member during the rotation of the latter.

In testimony whereof, I hereunto affix my signature.

JOHN F. ROGERS.