

No. 813,600.

PATENTED FEB. 27, 1906.

E. N. TRUMP.
GAS PRODUCER.

APPLICATION FILED NOV. 21, 1904.

4 SHEETS—SHEET 1.

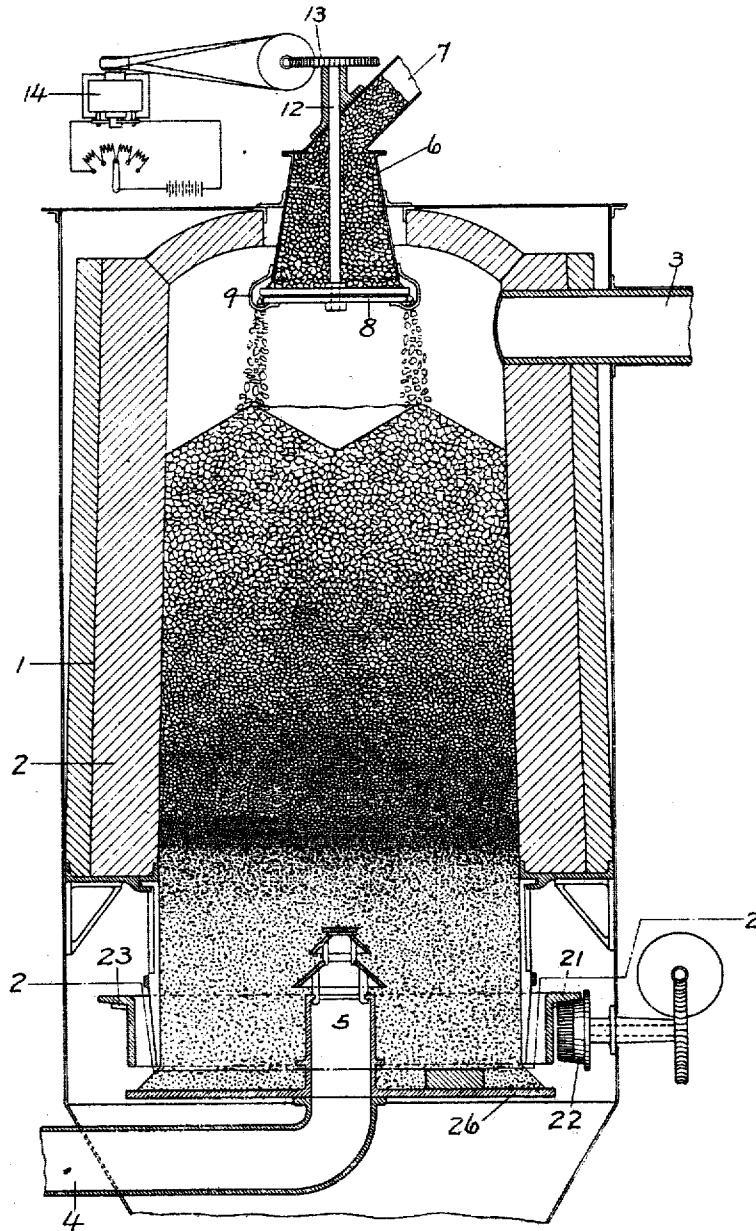


FIG. 1

WITNESSES:

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4 SHEETS--SHEET 2.

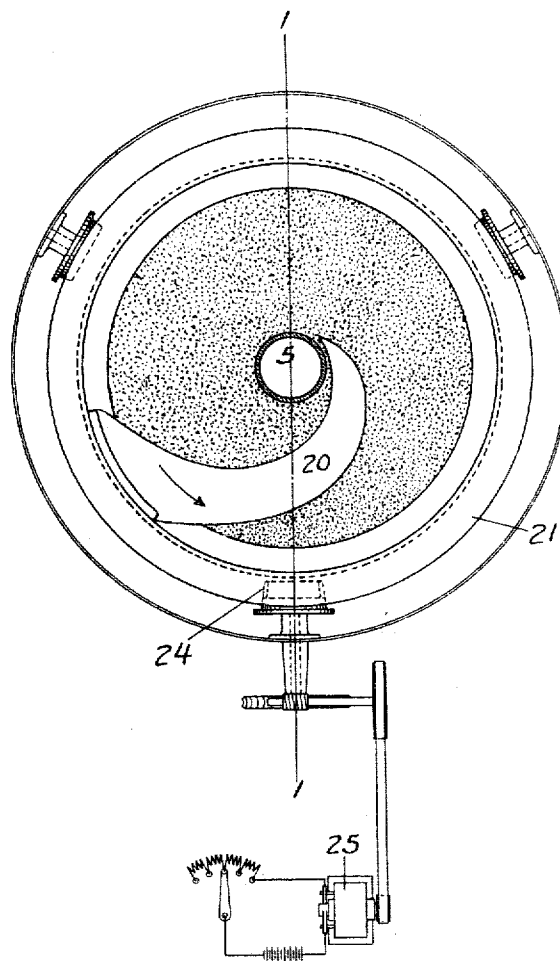


FIG. 2

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4 SHEETS-SHEET 3

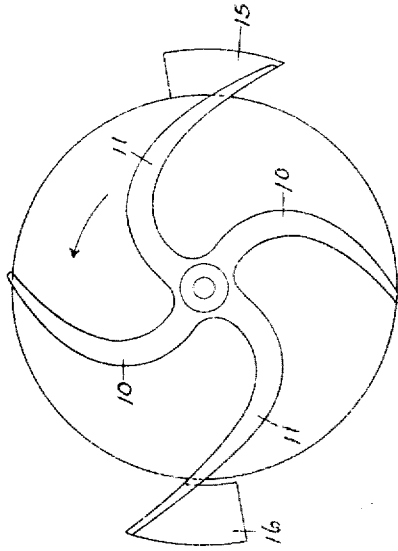


FIG. 4

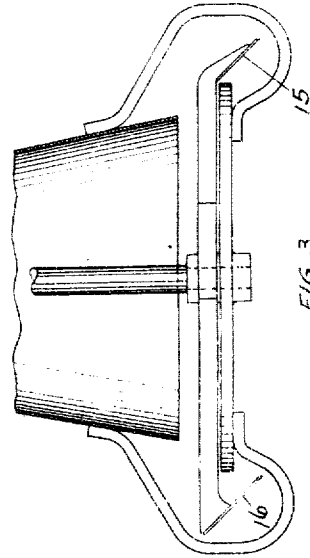


FIG. 3

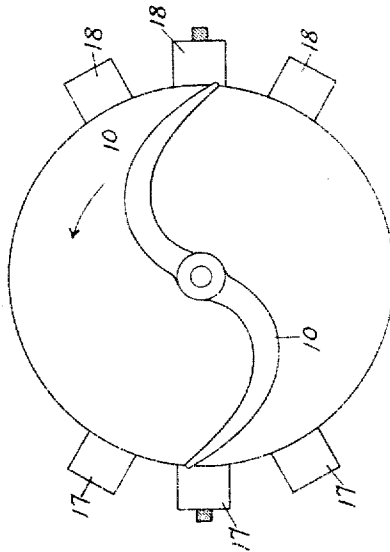


FIG. 6

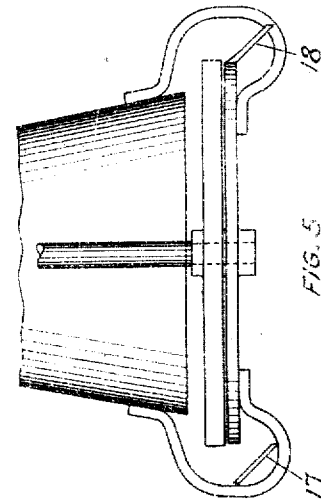


FIG. 5

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4 SHEETS—SHEET 4.

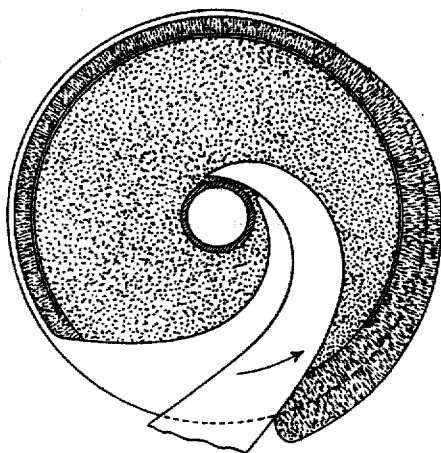


FIG. 8

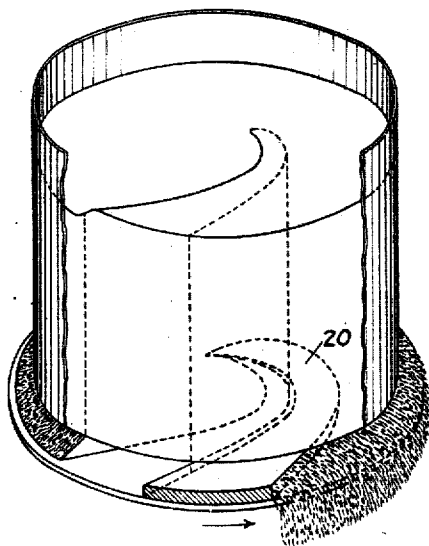


FIG. 7

WITNESSES:

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INVENTOR

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UNITED STATES PATENT OFFICE.

EDWARD N. TRUMP, OF SYRACUSE, NEW YORK.

GAS-PRODUCER.

No 813,600.

Specification of Letters Patent.

Patented Feb. 27, 1906.

Application filed November 21, 1904. Serial No. 233,609.

To all whom it may concern:

Be it known that I, EDWARD N. TRUMP, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Gas-Producer, of which the following is a specification.

My invention relates to gas-producers, my object being to provide improved means for the discharge of ash therefrom.

My invention comprises means for the gradual and regulatable discharge of ash from the combustion-chamber in such a way as to secure and maintain a series of intermittent cleavages in vertical planes throughout the height of the fuel-bed. These cleavages maintain a continual agitation of the bed of fuel and prevent the formation of either clinkers or coke, and thus admit of the use of coals which have hitherto been found impossible in a producer on account of the necessity for a great deal of labor in breaking up the coke-beds, which are formed during the distillation of the coal. In this way I not only secure the required discharge of the ash, but I obviate the necessity for resorting to means now commonly used for breaking up the clinkers which would otherwise be formed.

My invention is especially useful in connection with continuously-operating gas-producers provided with regulatable means for feeding fuel thereto, since by the proper regulation of the feed of fuel to the producer and the proper regulation of the discharge of ash therefrom said feed and discharge can be so adjusted relatively that the operation of the producer shall be continuous and automatic for an indefinite period.

I accomplish my object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section on line 1 1 of Fig. 2. Fig. 2 is a horizontal section on line 2 2 of Fig. 1 with a rheostat-controlled motor added diagrammatically. Fig. 3 is a fragmentary view in elevation, on an enlarged scale, of the feeding device, a portion of the hopper shown in section. Fig. 4 is a plan view of the rotating deflecting-blades and the table beneath the same shown in Fig. 3. Fig. 5 is a similar view, as shown in Fig. 3, showing a modification of the deflector or deflector-wings. Fig. 6 is a plan view of same.

Fig. 7 is a partial view in elevation of the combustion-chamber of the producer with the surrounding wall partly broken away to show the fuel-bed and the deflector for the discharge of the ash and the plan of cleavage of the fuel-bed caused thereby indicated in dotted lines. Fig. 8 is a horizontal section just above the deflector.

Similar numerals refer to similar parts throughout the several views.

The combustion-chamber of the gas-producer is stationary and is constructed in the usual way of the cylinder 1, lined with the fire-brick 2. This combustion-chamber is provided with the exit-pipe 3 for the gas, and the inlet 4, with discharge-nozzle 5, for delivering the blast to the fuel-bed. Projecting into the top of the combustion-chamber is the fuel-hopper 6, adapted to be supplied with fuel by the chute or conductor 7, connected with any suitable source of supply. The hopper 6 is provided with the stationary platform 8, which is hung on the brackets 9 at a distance below the lower extension of the side walls of said hopper 6. The brackets 9 are secured to said side walls. The platform 8 is adapted to be swept by a deflector or series of deflectors, consisting of radially-extending arms 10 and 11, mounted on the shaft 12 and driven by the worm-gear 13 from any suitable source of power—such, for instance, as the rheostat-controlled motor 14. These deflector-arms extend to the edge of the platform 8 or slightly beyond the edge and are adapted to be rotated to sweep the fuel over said edge entirely around the circumference of the table, so that said fuel shall fall in a circle on top of the producer-fuel bed. The deflector-wings 15, 16, 17, and 18 are utilized for securing the required distribution of the fuel to the top of the fuel-bed. It is obvious that by the means above described a very even feed of fuel to the combustion-chamber is secured, and by the employment of regulatable means for rotating the deflector the required rate of feeding the fuel may be secured and maintained. As the fuel becomes consumed it settles as an ash at the bottom of the combustion-chamber and must be discharged or removed therefrom during the continuing operation of the producer. For this purpose I provide automatic and regulatable ash-discharging means comprising the revolving deflector 20, mounted upon the

ring or structure 21, surrounding the base of the combustion-chamber. The deflector 20 projects from its supported end at the circumference of the base of the combustion-chamber toward and close to the axis of its own rotation and partially surrounds the blast-pipe 5. The ring 21 is supported upon the rollers 22 and is provided with a circular rack 23 upon its flange for cooperation with a pinion 24, which is driven by any suitable regulatable means—such, for instance, as the rheostat-controlled electric motor 25. The deflector 20 by the rotation of its supporting-ring 21 is caused to sweep the stationary table 26. This table 26 is stationary and spaced below the lower extension of the combustion-chamber sufficiently to afford space for the projection of deflector 20 therebetween. The deflector 20 is so shaped as to exert a wedge action upon the ash to push the same over the edge of the table 26. The shape of the deflector 20 is preferably curved or spiral, as shown in Fig. 2, and so positioned and moved in the direction of its convex side that the angle between the radius of its rotation and the tangent to its curve at the point of intersection of any radius is constant, so that when the best working angle is ascertained between the tangent of said curve and the intersecting radius the same is maintained constant throughout the working extension of the deflector. The rotation of the deflector 20 is extremely gradual and causes a very gradual discharge of the ash over the edge of the stationary table 26, as shown in Fig. 7. As the deflector 20 is gradually rotated through the bed of ash a space is left behind the deflector 20, having a vertical extension corresponding to the vertical extension or thickness of the deflector. The horizontal extension of this space will depend upon the extent of the span or bridge which the ash will support over such a space left by the deflector. This will vary with the consistency of said material. Such space will, however, usually be considerable. When the limit of this supporting power of the ash, due to its cohesion, has been reached, the bridge breaks and the superimposing bed comes down to fill the space left by the said deflector 20. This falling down of the ash to fill said space results in the falling of all the superimposed fuel-body, and consequently results in a vertical cleavage of said fuel-body throughout its vertical extension over said space left by the deflector. This is indicated by the dotted lines in Fig. 7. It follows that as the deflector gradually travels in its circular course there is thus an intermittent cleavage of the fuel-body during the entire operation of the producer, which effectually prevents the formation of clinkers or coke in said fuel-body, and, as above stated, not only obviates the necessity of using breakers or stirrers extending upwardly or downwardly

into the fuel-body, but also permits the use of coals which have hitherto been found impossible in a producer on account of the necessity of breaking up the coke-beds during the distillation of the coal.

By a proper regulation of the motor 25 with respect to the regulation of motor 14 the required adjustment between the feed of the fuel and the discharge of the ash with respect to the distillation and combustion of the fuel may be readily secured and maintained at all times.

What I claim is—

1. The combination of a stationary receptacle comprising a cylinder having a vertical extension and a table spaced below the lower extension of the cylinder, a deflector projecting beneath the cylinder and over the table, a support for said deflector located without the receptacle, and means for causing the said support to travel around the receptacle.

2. The combination of a stationary combustion-chamber, a stationary table spaced below the lower extension thereof, a rotatable member located without the periphery of said table and combustion-chamber, means for causing the rotation of said member, and a deflector carried by said rotating member projecting over the table from the circumference toward the center thereof.

3. The combination of a combustion-chamber, a stationary table spaced below the lower extension thereof, a deflector adapted to rotate about an axis corresponding to the center of the table, a member located outside of the periphery of said table for supporting the said deflector, and means for causing the gradual rotation of said supporting member.

4. The combination of a combustion-chamber, a stationary table spaced below the lower extension thereof, a rotatable body surrounding the chamber, and a deflector supported by said rotatable body for sweeping said table being so positioned and rotated and having such curved contact-face that the angle between the tangent of the curve and the radius of its rotation shall be the same at every point of intersection of radius and curve.

5. The combination of a combustion-chamber, a stationary platform spaced below the lower extension thereof, a deflector for sweeping said table, a rotatable member surrounding said combustion-chamber for supporting said deflector at its outer extension and means for causing the gradual rotation of said supporting member.

6. The combination of a combustion-chamber, a stationary platform spaced below the lower extension thereof, a deflector for sweeping said table, a rotatable member surrounding said combustion-chamber for supporting said deflector at its outer extension and regulatable means for causing the gradual rotation of the same.

7. In a continuously-operated gas-producer, the combination with regulatable mechanism for feeding fuel thereto, a combustion-chamber, a stationary table spaced below the lower extension thereof, a deflector adapted to rotate about an axis corresponding to the center of the table, a member, located outside of said chamber, for supporting the said deflector, and means for causing the gradual rotation of said supporting member.

EDWARD N. TRUMP.

Witnesses:

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MAE HOFMANN.