

No. 652,603.

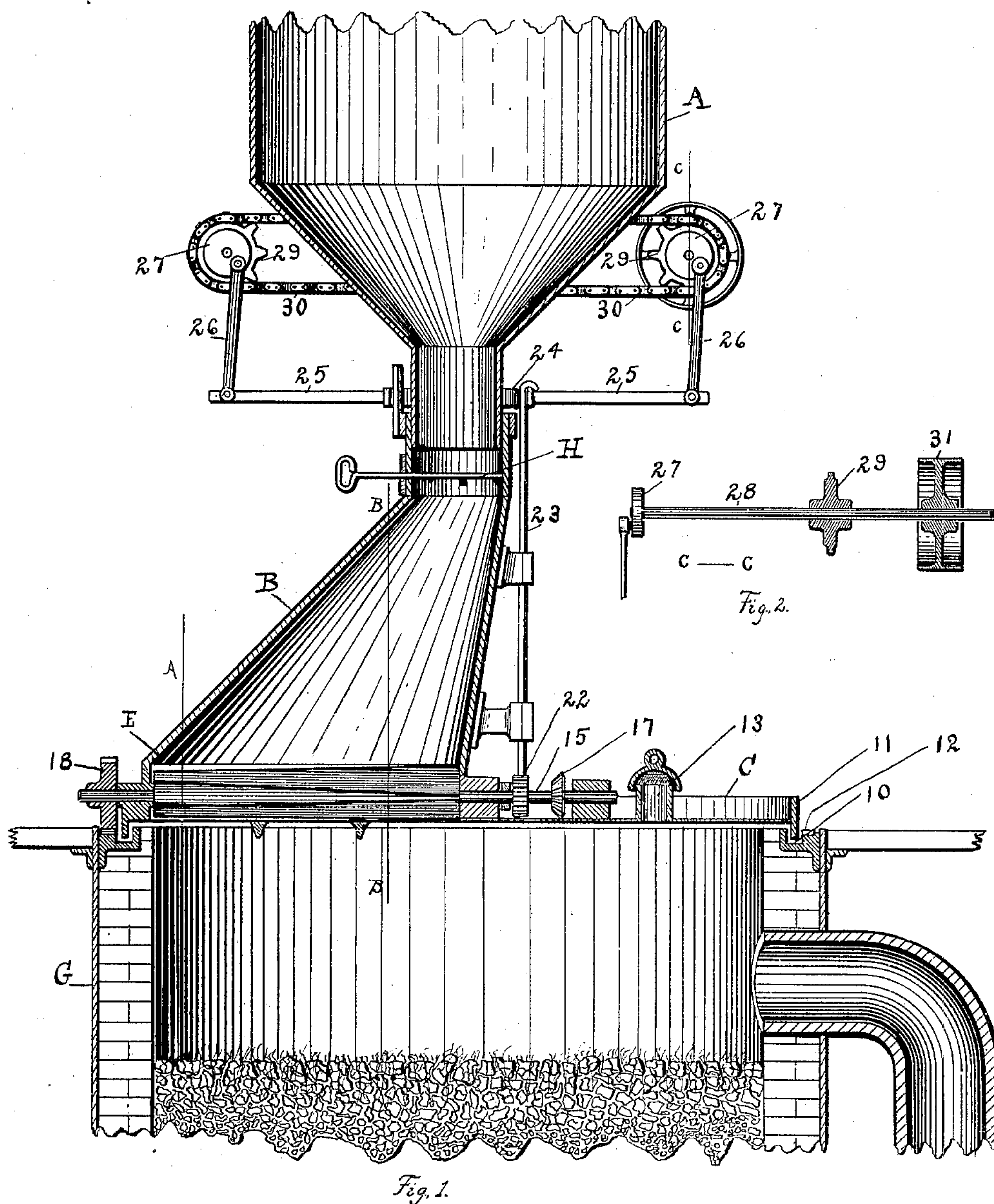
Patented June 26, 1900.

V. E. EDWARDS.
FEED DEVICE FOR GAS PRODUCERS.

(Application filed Apr. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
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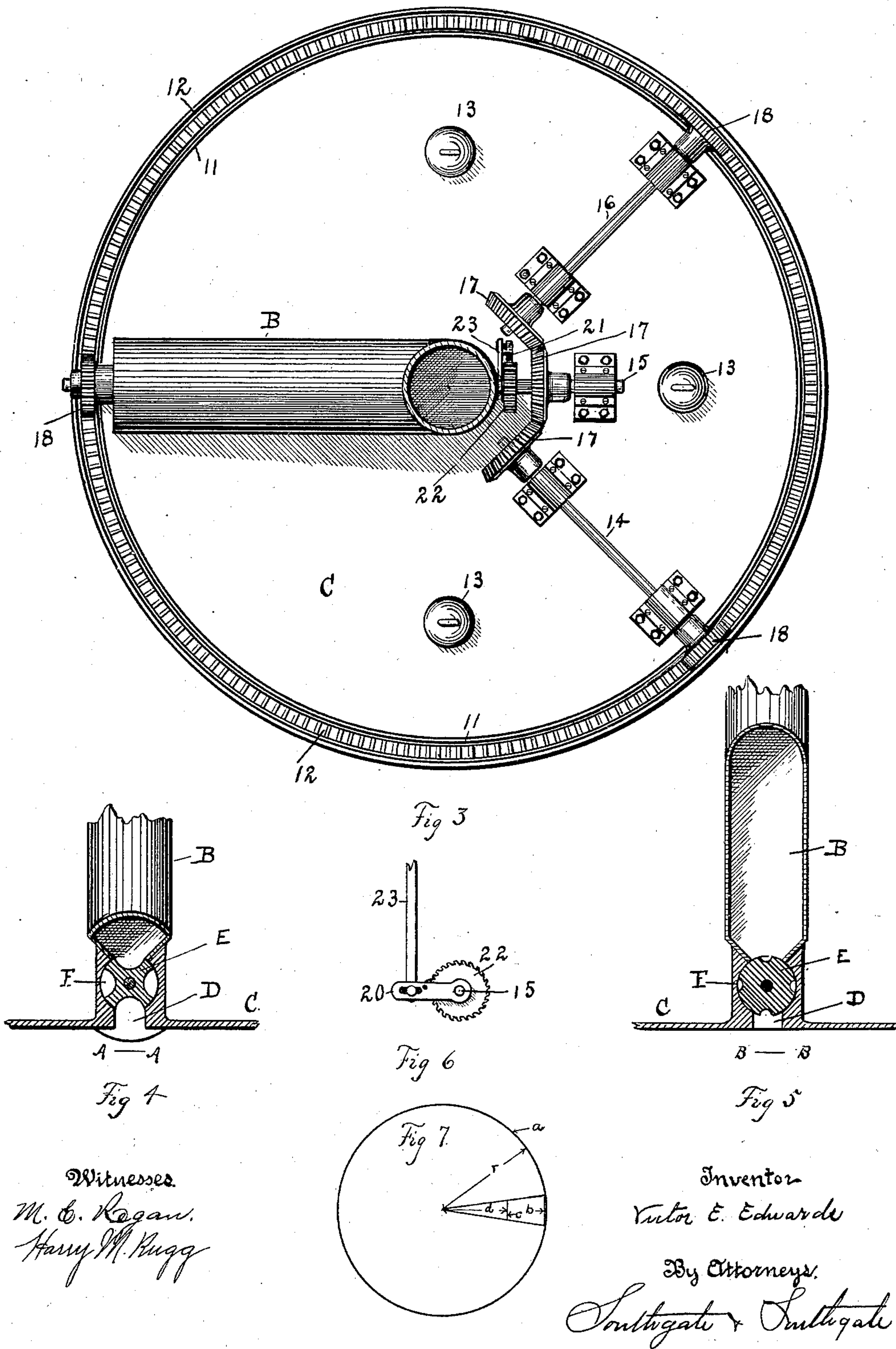
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UNITED STATES PATENT OFFICE.

VICTOR E. EDWARDS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE MORGAN CONSTRUCTION COMPANY, OF SAME PLACE.

FEED DEVICE FOR GAS-PRODUCERS.

SPECIFICATION forming part of Letters Patent No. 652,603, dated June 26, 1900.

Application filed April 27, 1899. Serial No. 714,649. (No model.)

To all whom it may concern:

Be it known that I, VICTOR E. EDWARDS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Automatic Feed Device Especially Adapted for Gas-Producers, of which the following is a specification.

My invention relates to an automatic feed device especially adapted for feeding coal into a cylindrical gas-producer.

One object of my invention is to provide a device which will automatically and continuously feed the coal in such manner that the same will be spread evenly in the gas-producer and kept therein at a constant level or uniform height. By keeping the whole surface constantly supplied with fresh fuel and by maintaining a constant level in the producer uniform combustion will take place and the fuel will be very economically used.

A further object of my invention is to provide a device which shall accomplish this automatic feeding and at the same time be gas-tight.

Referring to the drawings forming part of this application, I have illustrated therein the best form now known to me for practicing my invention:

In said drawings, Figure 1 is a sectional elevation of the top of a gas-producer with my invention applied thereto. Fig. 2 is a sectional view showing a detail of the driving-gearing. Fig. 3 is a plan view of the top of the producer. Fig. 4 is a sectional view taken on the line A A of Fig. 1. Fig. 5 is a sectional view taken on the line B B of Fig. 1. Fig. 6 is a detail of the ratchet mechanism, and Fig. 7 is a diagram which I will hereinafter refer to in describing the operation.

My invention consists in providing the gas-producer with a rotary chute arranged to deliver the material through an outlet extending substantially from the center to the edge of the body of the producer. A coal-reservoir is arranged above the producer, and the coal-chute is arranged between the mouth of the reservoir and the body. Mechanism is provided so that the coal will be fed from the reservoir down through the chute out through said outlet and is so arranged that the amount

of coal fed therethrough will increase from the center to the edge in direct proportion with the increase of radius. This arrangement by reason of the rotary motion of the chute will provide for a level spreading of the coal in the producer, because by this arrangement the amount of coal passing out through any section of the opening will be directly proportioned to the circle over which it has to be spread. I preferably provide the chute with a mechanical stoker to govern the supply of coal. This stoker may be of any desired construction, there being many forms now known which may be used in practicing my invention and which are equivalents of the one that I prefer to use. The form that I prefer to use consists of a fluted cylinder journaled near the outlet of the coal-chute. The flute or flutes on this cylinder increase in cross-sectional area from the center to the outer edge of the cover, so as to obtain the even distribution of coal. The chute is preferably arranged on the top of the producer, and said top is arranged so that it may be rotated. A water seal is preferably arranged between the body of the producer and the rotary top. Suitable gearing is provided to turn the top and the fluted cylinder as the top revolves. By this arrangement a very accurate, simple, and efficient device is provided which will automatically and evenly distribute the coal in the producer, and the device is substantially gas-tight.

Referring now to the drawings, I will describe my invention in detail.

A designates a coal-reservoir, and B a chute extending from the mouth of said reservoir. The chute is arranged on the mouth of the reservoir so that the same can turn thereon.

C designates the rotary top for the producer. The rotary top is provided with an opening D, which extends substantially from the center to the edge.

E designates a cylinder which is journaled at the mouth of said chute in position to drop the coal through the opening D in the cover.

The cylinder E is provided with one or more flutes F, which increase in cross-sectional area from the center to the edge in the proportion before described—that is, the area

of said flutes increases directly with the increase of radius. Plotting the area of any section of said flute, the rate of increase is such that the amount of coal supplied at any particular cross-section of the flute will be proportional to the circumference which said section describes, or, as such circumferences vary directly with the radii, will be directly proportional to the radius of the particular section.

In Fig. 7, if a designates the circle described by the outer end of the cylinder and the line b the area of the outer edge of the flute the area of any section, as c , will be to the area b as r , the radius of the cover, is to d , the distance of c from the center.

G designates the body of the producer, extending from which is the usual outlet-pipe for the gas.

A damper H may be arranged in the top of the chute to regulate or stop the supply of coal.

The body G is provided at its top with a flange, in which is formed an annular groove 10. Fitting into said groove is an annular flange 11, extending down from the rotary top. In practice the groove 10 is kept filled with water, whereby a water seal is formed between the rotary top and the body. The flange 11 is also extended above the rotary top, so that a body of water can be kept on top of the cover to keep the parts cool.

An annular rack 12 is arranged on the body G outside of the water seal.

Suitable openings 13 are arranged in the cover and are provided with suitable caps, so that if desired the operator may insert a poker or rake to break up the top surface of the fire.

A number of shafts, as 14, 15, and 16, are journaled in bearings secured to the top of the rotary cover C . These shafts have intermeshing bevel-gears 17 arranged thereon, as shown. On the outer ends of said shafts are arranged gears 18, which support the cover and which mesh with said annular rack 12. The cylinder E is arranged on one of said shafts, as shaft 15.

The annular rack 12 is preferably made with an odd number of teeth as compared with the teeth in the gears 18, or is so made that the number of teeth in the gears 18 or any divisor thereof will not divide into the number of teeth in the annular rack. By this arrangement a great many revolutions of the cover will have to take place before the parts will come again in precisely the same relation.

To rotate the cover, any suitable form of gearing may be used. The form that I have shown in the drawings consists in pivoting a lever 20 on the shaft 15 and in providing said lever 20 with a pawl 21, which engages a ratchet-wheel 22, secured on said shaft. Extending upwardly from said lever is a rod 23. This rod 23 is adjustably secured to the lever 20 and may be set at different points thereof,

so as to ratchet different numbers of teeth. The top end of the rod 23 is bent over and engages a ring 24, fitted on bearing-pieces extending up from the top of the chute. This ring is provided with extending arms 25, which connect by pitmen 26 to crank-disks 27, arranged on shafts 28, which are provided with sprockets 29, geared together by sprocket-chain 30. Power may be applied to one of the shafts 28, as by means of pulley 31. By this mechanism the rod 23 will be lifted up and down, the ratchet mechanism operated, and the cover thereby slowly turned. The speed may be varied by providing any of the usual change-speed mechanisms to drive the shaft 28 or by adjusting the rod on the lever.

As above stated, other forms of stokers may be provided in the coal-supply without departing from the scope of my invention as expressed in the claims.

In some cases I contemplate providing the cover with a plurality of openings and appurtenances for feeding the coal therethrough; but generally one opening, feed-chute, and stoker are sufficient.

While I have described my device as especially designed for use in connection with gas-producers, it is evident that the same may be applied to other purposes—as, for example, the distribution of coal or limestone in blast-furnaces—and to any place where it is desired to distribute material evenly inside of a cylindrical body.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a device of the kind described, the combination of the body, a rotary chute, an outlet from said chute extending substantially from the center to the edge of the body, and means for feeding the material through said outlet, substantially as described.

2. In a device of the kind described, the combination of the body, a rotary chute, an outlet from said chute extending substantially from the center to the edge of the body, a reservoir, and a stoker in said chute, substantially as described.

3. In a device of the kind described, the combination of the body, a rotary top therefor, an opening in said top extending from the center to the edge, a reservoir, a chute extending therefrom to the opening in the top, and a stoker arranged in said chute for feeding material through said opening, substantially as described.

4. In a device of the kind described, the combination of the body, a rotary chute therefor, an outlet from said chute extending substantially from the center to the edge of the body, and means for feeding material through said outlet in a quantity increasing from the center to the edge, substantially as described.

5. In a device of the kind described, the combination of the body, a rotary top therefor, an opening in said top extending substantially from the center to the edge, and a stoker

arranged to feed coal through said opening in quantity increasing from the center to the edge in direct proportion with the increase of radius, substantially as described.

5 6. In a device of the kind described, the combination of the body, a rotary top therefor, an opening in said top, and a stoker arranged to feed material through said opening in quantity increasing from the center to the edge,
10 substantially as described.

7. In a device of the kind described, the combination of the body, a rotary top therefor, an opening in said top extending from the center to the edge thereof, means for feeding material through said opening, and a water seal
15 between the body and the rotary top, substantially as described.

8. In a device of the kind described, the combination of the body, a rotary top therefor,
20 an opening in said top extending from the center to the edge thereof, a stoker arranged to feed material through said opening, and connections arranged so that the stoker will be actuated by the rotation of the top, substantially
25 as described.

9. In a device of the kind described, the combination of the body, a rotary top therefor, an opening in said top extending from the center to the edge thereof, and a stoker consisting
30 of a fluted cylinder for feeding coal through said opening, substantially as described.

10. In a device of the kind described, the combination of the body, a rotary top therefor, an opening in said top, and a stoker consisting
35 of a fluted cylinder for feeding material through said opening, the flute or flutes on said cylinder increasing in area from the center to the outer edge of the top, substantially as described.

40 11. In a device of the kind described, the combination of the body, a rotary top therefor, an opening in said top extending from the center

to the edge thereof, a reservoir, a chute extending from the reservoir to said opening, and a fluted cylinder journaled in said chute, 45 substantially as described.

12. In a device of the kind described, the combination of the body, a top therefor, an opening in said top, a reservoir, a chute extending therefrom to the opening in the top, 50 a fluted cylinder journaled in said chute, means for rotating said cover, and connections for turning said fluted cylinder as the cover rotates, substantially as described.

13. In a device of the kind described, the 55 combination of the body, a rotary top therefor, an opening in said top, a fluted cylinder for feeding material through said opening, a number of shafts journaled on said cover, said cylinder being mounted on one of said shafts, 60 said shafts being geared together, gears on the ends of said shafts, an annular rack which said gears engage, and mechanism for turning said gears to rotate the cover and turn the cylinder, substantially as described. 65

14. In a device of the kind described, the combination of the body, a rotary top therefor, an opening in said top, a fluted cylinder for feeding material through said opening, a number of shafts journaled on said cover, said 70 cylinder being mounted on one of said shafts, said shafts being geared together, gears on the ends of said shafts, an annular rack which said gears engage, and a ratchet mechanism for turning said gears to rotate the cover and 75 turn the cylinder, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

V. E. EDWARDS.

Witnesses:

LOUIS W. SOUTHGATE,
GEO. SIEURIN.