

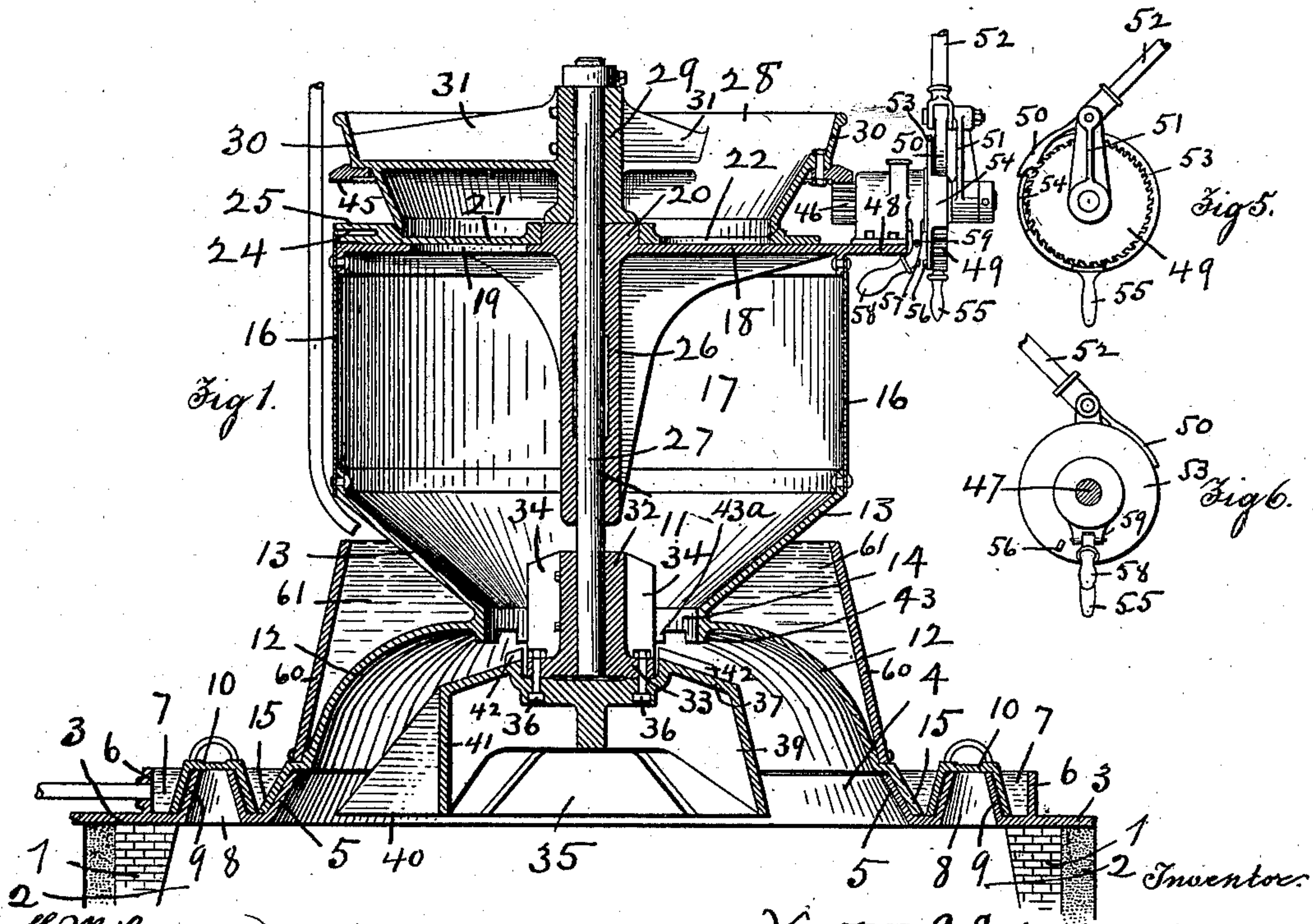
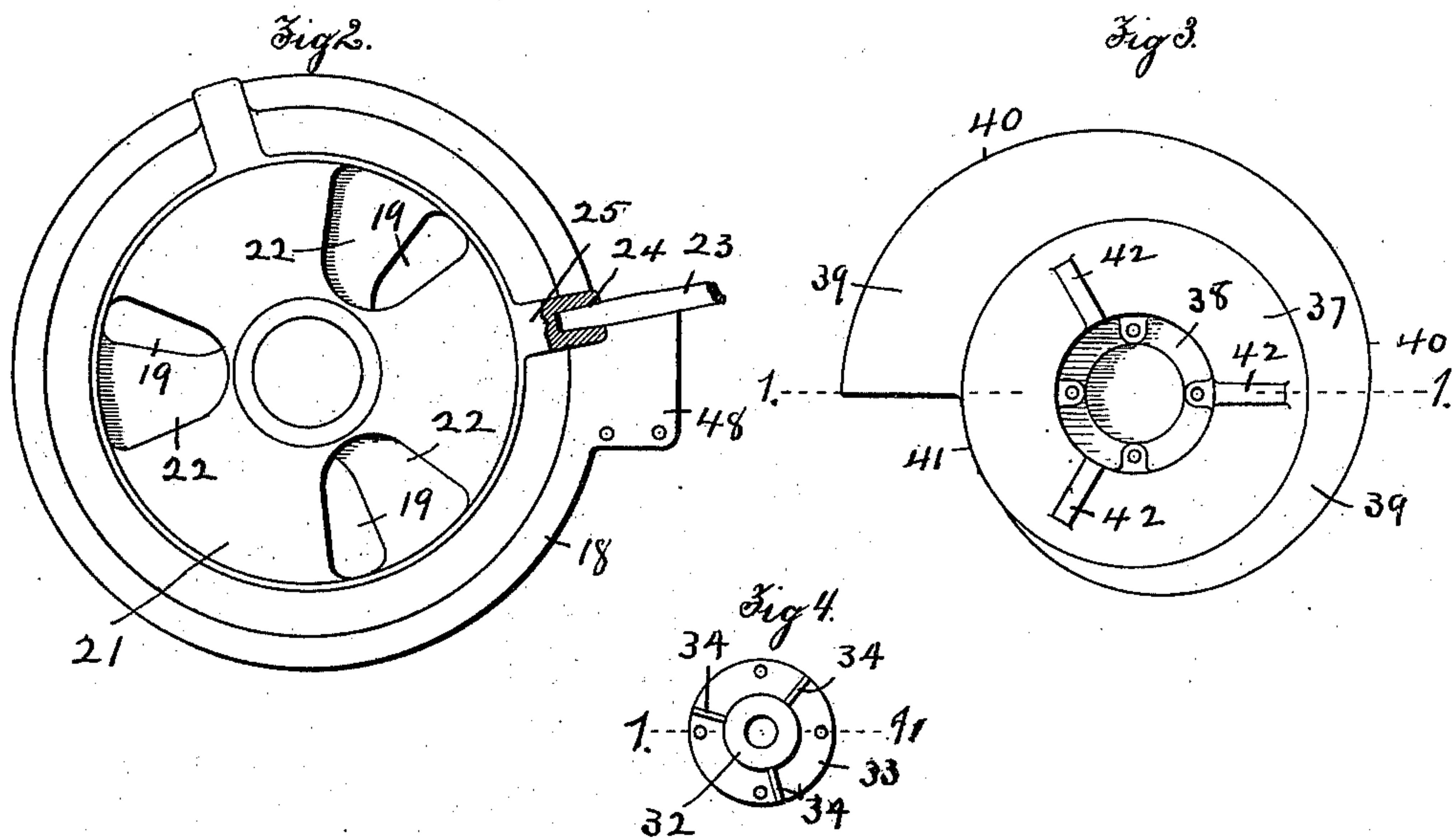
No. 756,945.

PATENTED APR. 12, 1904.

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

APPLICATION FILED SEPT. 7, 1900.

NO MODEL.



H. M. Hugg
McPrice

Witnesses

Inventor:
Victor E. Edwards
By Rufus S. Fowler Atty.

UNITED STATES PATENT OFFICE.

VICTOR E. EDWARDS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO
THE MORGAN CONSTRUCTION COMPANY, OF WORCESTER, MASSACHU-
SETTS, A CORPORATION OF MASSACHUSETTS.

FEED DEVICE FOR GAS-PRODUCERS.

SPECIFICATION forming part of Letters Patent No. 756,945, dated April 12, 1904.

Application filed September 7, 1900. Serial No. 29,275. (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 Commonwealth of Massachusetts, have invented a new and useful Improvement in Feed Devices for Gas-Producers, of which the following is a specification accompanied by drawings forming a part of the same, which—

Figure 1 represents a central vertical sectional view of a feed device for a gas-producer embodying my invention. Fig. 2 is a top view of the registering-gate between the rotating hopper and coal-reservoir. Fig. 3 is a top view of the distributing-shovel detached from its rotating shaft. Fig. 4 is a top view of the flange-hub to which the shovel is attached. Fig. 5 is a front view of the pawl-and-ratchet mechanism for rotating the hopper. Fig. 6 is a rear view of the same.

Similar reference-figures refer to similar parts in the different views.

The objects of my present invention are to provide an efficient mechanism for the uniform feeding and distribution of coal to a gas-producer and for controlling its supply, to provide means for cooling the coal-reservoir to prevent coking, to protect the distributing-shovel from the action of heat, and to render the parts more accessible; and these objects, among others, I accomplish by means of the novel construction and arrangements of parts, as hereinafter described, and set forth in the annexed claims.

My present invention relates to that class of feeding devices for gas-producers in which the supply of coal is mechanically fed to the heating-chamber of the producer by means of a rotating shovel, and it is an improvement upon the feeding mechanism described in the United States Patents Nos. 442,676 and 698,229, issued to Carl W. Bildt, December 16, 1890, and May 30, 1893.

Referring to the drawings, 1 denotes the upper portion of the walls which inclose the heating-chamber 2 of a gas-producer which is of the ordinary and well-known form of construction. Upon the walls 1 of the gas-pro-

ducer is placed an annular plate 3, forming a cover for the heating-chamber and provided with a central opening 4, which is surrounded by a tapering flange 5, raised a few inches above the horizontal surface of the annular plate 3. Concentric with the tapering flange 5 is a vertical flange 6, extending upwardly from the horizontal surface of the annular plate 3 and forming, with the tapering flange 5, the side walls of an annular water-pan 7, concentric with the opening 4, and provided at intervals with circular openings 8 to allow access to the heating-chamber 2. The openings 8 are surrounded by the tapering walls 9, extending upwardly from the annular plate 3 slightly above the water-line in the pan 7, and the openings 8 are closed by inverted-cup-shaped covers 10. Supported upon the annular plate 3, with its lower edge resting upon the bottom of the water-pan 7, is a cast-iron shell 11, preferably cast in a single piece, with its lower portion consisting of a dome-shaped section 12 and an upper conical or hopper-shaped section 13, having an opening 14 between the lower and upper sections 12 and 13. The lower edge 15 of the dome-shaped section 12 is flaring to fit the tapering flange 5 of the annular plate 3, by which the shell 11 is held from lateral movement with the center of the opening 14 over the center of the opening 4 in the annular plate 3. Bolted to the upper edge of the hopper-shaped section 13 is an annular band 16, preferably of sheet metal and forming the vertical walls of the coal-reservoir 17. Attached to the upper edge of the band 16 and forming a cover for the coal-reservoir 17 is a plate 18, having a series of openings 19, Fig. 2. The plate 18 is provided on its upper surface with a short circular hub 20, which forms the bearing for a plate 21, provided with openings 22 and capable of being turned about the hub 20 in order to open or close the openings 19 and form a registering-gate to control the flow of coal to the reservoir. The gate 21 is conveniently turned on the hub 20 by inserting a hand-lever 23, Fig. 2, in a socket 24, formed in a projecting arm 25 on the side of the plate or gate 21. The plate 18 is also provided on its

underside with a long depending hub 26, which forms a journal-bearing for a rotating shaft 27, to the upper end of which is attached a hopper 28, having a central hub 29 resting upon the short hub 20 of the plate 18. The rotating hopper 28 consists of an annular tapering shell 30, open at the top and bottom and suitably strengthened by radial ribs 31, extending from the central hub 29. To the lower end of the rotating shaft 27 is attached the hub 32, having at its lower end a horizontal flange 33 and a series of radial vertical blades or wings 34. To the flange 33 of the hub is attached a shovel 35 by means of bolts 36, by which the shovel is supported immediately beneath the opening 14 in the hopper 13. The shovel 35 consists of a scroll-shaped shell comprising an upper disk 37, preferably having a central recess 38 to receive the flange 33 of the hub 32 and having its surface preferably slightly inclined from the central recess downward toward its outer edge.

Projecting downward and outward from the circular disk 37 is a scroll-shaped flange or plate 39, its lower edge 40 forming a spiral line, so that the coal flowing over different portions of the plate 39 will be delivered into the chamber 2 of the gas-producer at varying distances from the center. The spiral plate 39 does not extend entirely around the disk 37, but a short space is left between the ends of the spiral plate, in which the disk is provided with a vertical wall 41, allowing the coal to fall from the disk 37 substantially in the center of the heating-chamber 2, while that falling over the scroll-shaped plate 39 is delivered in the heating-chamber from the center outward, causing an even distribution of the coal. The upper surface of the disk 37 is slightly inclined, being the highest at the center, to facilitate the flow of the coal, and it is provided with upwardly-projecting ribs 42, which rotate beneath the serrated edge of a flange 43, depending from the dome 12 and concentric with the axis of the rotating shovel and having teeth 43^a to engage the coal carried by the shovel. The hub 32 is also provided with radially-extending blades or wings 34, which disturb the coal and prevent its clogging at the contracted opening 14. The vertical shaft 27, carrying the shovel 35 at its lower end and the hopper 28 at its upper end, is rotated in the present instance by means of an annular rack 45, attached to the sides of the hopper and engaged by a pinion 46, carried by a short shaft 47, journaled in suitable bearings supported on an extension 48 of the plate 18. The shaft 47 and ratchet-wheel 49 is given an intermittent motion by a reciprocating pawl 50, carried by the end of a radial arm 51, pivoted concentrically with the axis of the ratchet-wheel and connected by a link 52 with actuating mechanism (not shown in the drawings) by which a reciprocating motion is given to the arm

51 and pawl 50 in the usual manner for the purpose of imparting an intermittent rotary motion to the shaft 47 and through the rack and pinion 45 and 46 to the hopper 28 and shovel 35. Journaled upon the shaft 47 and at the side of the ratchet-wheel 49 is a disk 53, provided with a flange 54, adapted to be moved beneath the pawl 50 to disengage it from the ratchet-wheel. The disk 53 is provided with a handle 55, by which the disk is rocked to disengage the pawl. The handle 55 is attached to the lower side of the disk and is weighted to normally hold the disk in the position shown in Fig. 5, with the flange 54 out of engagement with the pawl 50. By raising the handle 55 the flange 54 is carried beneath the pawl and the disk is held from resuming its normal position by means of a lug 56, projecting from the side of the disk, which is engaged by a similar lug 57, projecting from the side of a weighted handle 58, hinged at 59, so that the weight of the handle 58 will normally hold the lug 57 in engagement with the lug 56. When the pawl 50 has been disengaged from the rotating wheel, thereby interrupting the action of the hopper 28 and shovel 25, the pawl may be again brought into engagement with the ratchet-wheel by lifting the handle 58 into the position shown in Fig. 1; thereby disengaging the lugs 56 and 57 and allowing the weight of the handle 55 to again return the disk 53 to its normal position and release the pawl 50.

The entire feeding apparatus is contained in an independent structure entirely detached from the gas-producer, and it is supported by the lower edge 15 of the dome 12, which is supported upon the upper surface of the annular plate 3, allowing access to the heating-chamber of the gas-producer by lifting the structure containing the feeding mechanism from the annular plate 3. The dome 12 incloses a space which contains the rotating shovel, which is thereby elevated entirely above the heating-chamber 2 and above the plain of the escape-flue of the gas-producer, thereby withdrawing the shovel from the path of the currents of heated gas and protecting it from the action of the intense heat of the gas-producer. The dome 12 is surrounded by a metal band 60, attached at its lower edge to the sides of the dome, forming a water-tight joint and having its upper edge overlapping the sides of the cone 13 to form a water-reservoir 61 for the purpose of reducing the temperature within the cone 13 and prevent the coking of the coal gathered at the contracted opening 14.

The operation of my improved feeding device is as follows: An intermittent rotary motion is given to the hopper 28, rotating the shaft 27 and shovel 35, and coal is fed to the hopper 28, from which it flows through the openings 19, which may be opened or closed by the registering-gate 21 to control the de-

livery of coal to the reservoir 17. The coal at the contracted opening 14 in the hopper 13 is loosened and prevented from clogging by the action of the radial blades 34, carried by the hub 32, and as it falls upon the shovel 35 it is uniformly distributed thereon by the action of the ribs 42, rotating beneath the serrated flange 43. The coal delivered to the shovel 35 flows over the edge of the disk 37, a portion falling over the vertical wall 31 to the center of the heating-chamber and other portions flowing over the scroll-like edge 40 of the plate 39 and becoming uniformly distributed from the center of the heating-chamber outward.

The feeding mechanism forming the subject of my present invention possesses several advantages over those shown in the patents to Bildt aforesaid. The delivery of coal to the reservoir is controlled independently of the supply fed to the hopper by means of the registering-gate, and the continuous delivery of coal through the contracted openings produced by the adjustment of the delivery-gate is secured by the rotary movement of the hopper. The reservoir 17 and hopper 13 receive the coal from the rotating hopper and deliver it through the contracted opening 14 upon the top of the rotating shovel consisting of a disk of comparatively small area and having an inclined upper surface which affords but little impediment to the free movement of the coal. The distribution of the coal in the heating-chamber 2 is also secured by a shovel, which obviates the use of inwardly-directed blades by which the coal is conducted directly beneath the shovel, forming contracted passages, which are liable to clog. Simplicity of construction is secured by journaling the rotating shaft in a single long bearing depending from the plate 18 instead of by two or more bearings which require to be held in alinement by the framework of the machine.

The entire feeding mechanism, including the shovel, is removed from the heated chamber of the gas-producer, and the supporting-framework for the rotating mechanism, together with the coal-hoppers, is entirely disconnected from the covering-plate of the gas-producer chamber 2, the joint between the two being water-sealed by the insertion of the dome 12 in the water-pan 7. I abstract the heat, which would prove injurious to the structure and prevent the coking of the coal before it is delivered to the heating-chamber, by maintaining a body of water in contact with the upper portion of the dome 12 and hopper 13.

The shovel may be detached by means of the bolts 36 and replaced when desired, and the interior of the gas-producer is rendered accessible by the removal of the feeding mechanism from the annular plate 3.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination in a feeding device for a

gas-producer of a coal-reservoir 17 having a hopper-shaped bottom provided with an opening 14, a depending serrated flange surrounding said opening, a rotating disk beneath said opening and a series of ribs or projections on said rotating disk opposing the serrated edge of said flange, substantially as described.

2. The combination in the feeding device for a gas-producer, having an opening through which coal is fed to the heating-chamber of the producer, of a removable plate over said opening, a long depending hub from said plate, a shaft journaled in said hub and a coal-distributing device carried by said shaft, substantially as described.

3. The combination with a coal-reservoir having a hopper-shaped bottom and an opening therein for the delivery of coal from the reservoir, of a removable plate forming a cover for said reservoir and having holes for the admission of coal to the reservoir, of a long depending hub extending from the under side of said plate into said reservoir, a rotating shaft journaled in said hub, a shovel carried by the lower end of said shaft and means for rotating the shaft, substantially as described.

4. The combination of a coal-reservoir having supply and discharge openings, of a rotating shovel placed beneath said discharge-opening and consisting of a central disk having a coal-distributing flange, said central disk having an annular inclined surface to facilitate the passage of the coal, substantially as described.

5. The combination with the heating-chamber of a gas-producer, of a coal-reservoir having a discharge-opening through which coal is discharged to said heating-chamber, a rotating hopper above said reservoir, a series of openings between said hopper and said reservoir and means for varying the size of said openings, whereby the supply of coal is controlled, substantially as described.

6. In a feeding device for a gas-producer, the combination of a coal-reservoir having supply and discharge openings, means for distributing the coal delivered through said delivery-opening, means for closing said supply-opening, a rotating hopper placed above and in communication with said supply-opening and means for rotating said hopper, substantially as described.

7. The combination with the heating-chamber of a gas-producer, of a feeding mechanism comprising the following instrumentalities, a chamber above the heating-chamber, coal-distributing apparatus in said chamber, a coal-reservoir above said coal-distributing chamber, a rotating hopper above said reservoir and variable openings between said hopper and said coal-reservoir, substantially as described.

8. The combination with the rotating hopper 28, of an annular rack attached to said hop-

per, a pinion engaging said rack, a pawl-and-ratchet mechanism by which said pinion is rotated, means for disengaging said pawl consisting of a disk 53, flange 54, weighted handle 55, lug 56, a weighted hinged latch 58 and lugs 57, substantially as described.

9. The combination of a coal-reservoir having a discharge-opening for the delivery of coal to the gas-producer, a plate 18 supported by said reservoir and having a supply-opening for the admission of coal, a long depending hub extending from said plate into said reservoir, a shaft journaled in said hub, a short hub extending upward from said plate, a registering-gate journaled on said short hub, a central hub resting on said short hub and attached to said shaft, a hopper carried by said central hub, means for rotating said hopper

and a distributing shovel carried by said shaft and located beneath the discharge-opening of said coal-reservoir, substantially as described. 20

10. The combination with a gas-producer of a shell supported above the heating-chamber of the producer and having a lower dome-shaped section and an upper hopper-shaped section communicating with said lower section and forming a portion of a coal-reservoir, of a band resting on said dome-shaped section and overlapping said hopper-shaped section to form a water-reservoir, substantially as described. 25 30

Dated this 4th day of September, 1900.

VICTOR E. EDWARDS.

Witnesses:

E. H. CARROLL,

J. R. GEORGE.