

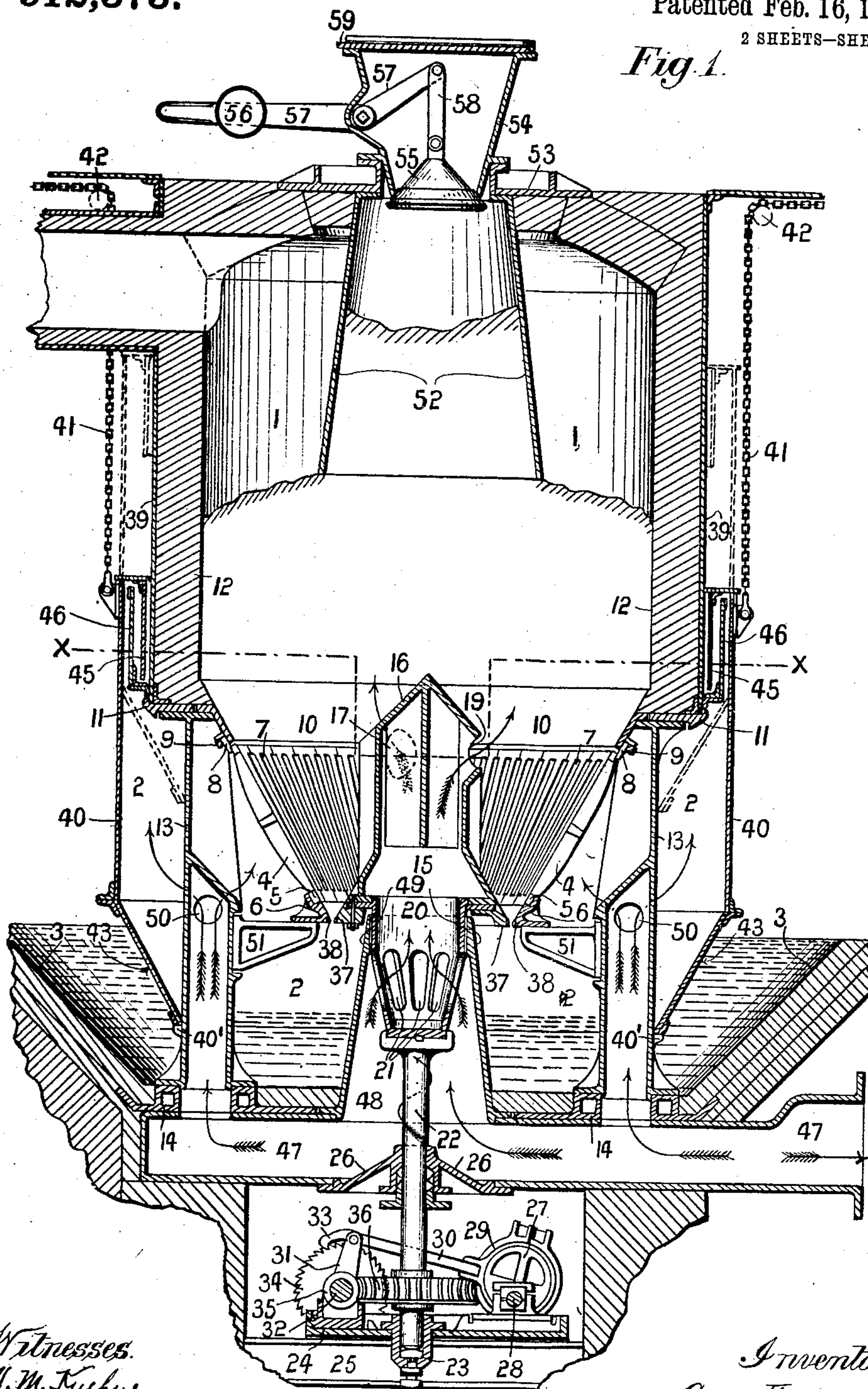
912,373.

G. HATTON.  
GAS PRODUCER.  
APPLICATION FILED MAY 23, 1906.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



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Att'y



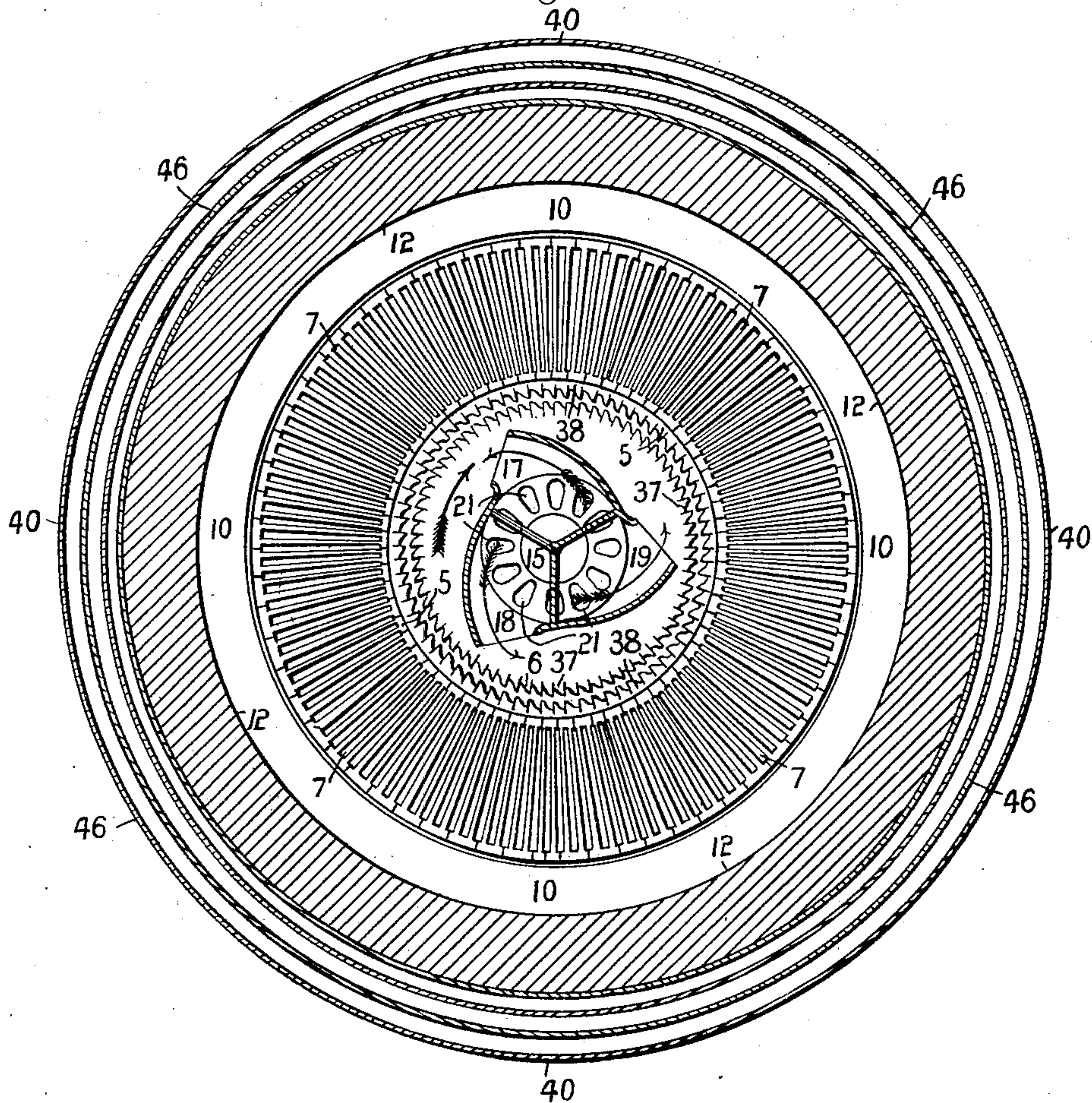
GAS PRODUCER.

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2 SHEETS--SHEET 2.

*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

GEORGE HATTON, OF SALTWELLS HOUSE, NEAR BRIERLEY HILL, ENGLAND.

GAS-PRODUCER.

No. 912,373.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed Mar. 20, 1905. Serial No. 261,890.

*To all whom it may concern:*

Be it known that I, GEORGE HATTON, a subject of His Majesty the King of Great Britain and Ireland, residing at Saltwells House, near Brierley Hill, in the county of Stafford, England, have invented new and useful Improvements in Gas-Producers, of which the following is a specification.

This invention consists of the herein described improvements in gas producers my object being to reduce labor and obtain increased efficiency.

I will describe my invention by referring to the accompanying drawings on which—

Figure 1 is a sectional elevation of a gas producer constructed in accordance with this invention, and Fig. 2 is a sectional plan of a part of the same on line X X of Fig. 1.

The same reference numerals indicate the same or corresponding parts in all the figures.

A gas producer constructed in accordance with this invention is preferably circular in plan and has an upper portion or combustion chamber 1 containing the fuel, a lower chamber 2 in which a pressure of blast is maintained and a basement pan 3 containing water forming an air-tight seal through which the ashes may be removed in the customary way while the producer is in operation. The said gas producer has a circular grating for supporting the fuel formed by fire bars 4 arranged as a section of an inverted cone, the bars at their lower and inner ends 5 resting on a central supporting ring 6 and radiating upwards and outwards so that their upper and outer ends 7 reach to and are supported at the bottom of the combustion chamber lining by resting on cotters or the like 8 which pass through slots in the lugs 9 formed on the bottom of the downwardly and inclined projecting flange 10 which is cast with the base plate 11 which carries the combustion chamber lining 12. This combustion chamber base plate 11 is carried by upright stanchions 13 from the bottom plate 14 of the gas producer at the bottom of the basement 3.

Projecting up through the center of the central supporting ring 6 there is a central blast pipe 15 having a closed top 16 and one or more say three horizontal openings or twyers 17, 18, 19, at its upper end projecting slightly into the fuel for the purpose of supplying blast to the same. To the central vertical blast pipe 15 a continuous or inter-

mittent rotary motion is imparted by means of suitable gearing such for instance as that shown on my drawing where it will be seen that the central vertical blast pipe 15 is fixed to a lower hollow vertical circular part 20 which has blast inlet holes 21 and is fixed to the top of a vertical spindle or shaft 22 which is carried by and revolves in a foot-step 23 suitably supported by base plate 24 on the girder 25 and above the foot-step 23 there is also a bearing 26 in which the shaft 22 revolves. Gearing for rotating the shaft 22 may consist of an eccentric 27 mounted on the revolving shaft 28 and by means of the eccentric strap 29 and eccentric rod 30 this actuates a ratchet lever 31 carried on the worm shaft 32 and this ratchet lever 31 carries a ratchet 33 which gears with a ratchet wheel 34 mounted on the shaft 32. On the shaft 32 there is a worm 35 which gears with the worm wheel 36 fixed on the spindle 22. The shaft 28 receives rotary motion from any convenient source and then by the gearing a slow intermittent rotary motion is imparted to the vertical shaft 22 and central vertical blast pipe 15 in the direction shown by the arrows in Figs. 1 and 2.

To the bottom of and outside the vertical blast pipe 15 there is fixed a toothed ring 37 made with external teeth and inside the central supporting ring 6 there are formed corresponding inclined teeth 38 which are made somewhat larger in diameter than the teeth 37 so that the teeth will not quite touch when the blast pipe 15 is rotating. The teeth of the rotating part 37 are in the same plane as the stationary teeth 38 and in close proximity thereto but they do not necessarily touch and the teeth are by preference inclined and shaped as shown so that these teeth will form the functions of a mill crushing and reducing to a granular condition any clinker which may be formed in the producer so that this crushed clinker falls away through the spaces between the rotating teeth 37 and stationary teeth 38 into the bottom of the basement pan 3 so that from the water seal the ground clinker can easily be scraped out up the inside sides of the pan 3. The rotation of the blast pipe 15 has a two fold object namely the crushing of all clinker as above described and the equal distribution of the blast from the twyers 17, 18, 19 to all parts of the fuel in the producer in turn. It will be seen that the outlets 17, 18, 19 are curved in the oppo-



site direction to that in which they rotate so as to prevent any possibility of the fuel working down the twyer holes 17, 18, 19.

The upper portion of the producer containing the fuel is lined with fire-brick lining 12 and inclosed in a fixed casing 39 made of wrought iron or steel plates in the usual way carried on the base plate 11 above referred to but as will be seen this fixed casing 39 only extends downwardly approximately to the bottom of the level of the fire-brick lining 12.

The space around and below the fire bars 4 is inclosed by a lower and separate wrought iron or steel cylindrical or other casing 40 which is made somewhat larger than the upper casing 39 over which the outer casing is free to pass vertically and telescopically. The outer casing 40 is suitably counterbalanced by counterbalance weights on the chains 41 running over overhead pulleys 42. The lower part 43 of the lower casing 40 is coned inwardly to a smaller diameter and when the lower casing is in its working position its lower edge dips in the water contained in the basement pan 3 at the base of the producer and rests upon lugs 40' on the stanchions 13. The upper part of the outer casing 40 is provided with an inner downwardly projecting flange 45 which dips into a trough 46 containing water and attached to the outer bottom edge of the upper casing 39. Thus there is a water seal both at the bottom and at the top of the lower casing 40 which latter thus forms an air-tight chamber around and below the bars 4 of the producer so as to inclose the blast round the fire bars.

The blast for the producer is introduced into the vertical rotating blast pipe 15 from the blast pipe 47 arranged below the water pan 3 and provided with an upwardly projecting central conical pipe like part 48 the top 49 of which is circular and bored and forms a bearing for the lower hollow portion 20 of the rotating blast pipe to revolve in. While the blast is supplied from the blast pipe 47 up the central pipe 48 and through the openings 21 into the hollow rotating blast pipe 15 and through the twyers 17, 18, 19 into the fuel, the blast is also conveyed from the blast pipe 47 into the air-tight chamber 2 up the stanchions 13 which are made hollow and through the outlets 50 therein and into the air-tight chamber 2. Thus an equal blast pressure is provided both below and through the bars 4 and through the twyers 17, 18, 19 in the upper rotating portion 15 of the blast pipe.

It will be understood that in the arrangement shown by Figs. 1 and 2 the supporting ring 6 which carries the lower ends of the fire bars 4 is itself supported from the stanchions 13 by brackets 51 fixed to the stanchions and to which the ring 6 is fixed.

By turning off the blast and raising the lower casing 40 up as far as it will go as shown by the dotted lines in Fig. 1, the lower portion of the producer together with the grate and blast pipe are rendered easily accessible for inspection or repairs. Any fire bar can readily be removed and replaced by first sliding up the cotter or the like 8 belonging to it so as to release the top of the fire bar and allow the same to be pulled outwardly and then by an upward movement of the fire bar the lower end will be free.

The means for feeding the fuel into the producer shown on my drawings are of the ordinary kind and form no part of this invention the said means consisting of an inwardly projecting bell or like part 52 open at the top and bottom and projecting down into the combustion chamber 1 of the producer to the top of the fuel and thus regulating the height of the same, and this bell 52 is carried from the top of the furnace by a plate 53 to which also the fuel inlet mouth 54 is fixed and the bottom of this is closed by the valve 55 which is held up in position by the counterweight 56 on the lever 57 connected by links 58 to the valve 55.

59 is a sliding valve for closing the top of the fuel mouthpiece 54.

The accompanying drawings illustrate what I consider to be the best ways of carrying my invention into effect but it is to be understood that my invention is not limited to the precise details shown, as these may be modified to some extent without departing from the nature of my invention, as for instance the shape of the grate instead of being circular and a section of an inverted cone, may if desired be square, or polygonal, when the grate instead of being the shape of an inverted cone will be a section of an inverted pyramid. I also wish it to be understood that I am well aware that prior to my invention gas producers have been made in which the fire grate is shaped like a section of an inverted cone, also that gas producers with a grate of this kind have been made with a central stationary blast pipe passing up through the center of the grate, also that a central rotating stirrer has been used in a gas producer and therefore I do not make any claim to these features.

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

1. In a gas producer, the combination of a grate having the shape of a section of an inverted cone or pyramid with a mechanically driven central rotating twyer arranged to supply blast to the fuel, said twyer having outlets therein, said outlets being curved in a direction opposite to that in which the twyer rotates substantially as set forth.

2. In a gas producer having a lower air chamber and a water seal through which ashes are removed, a support in said water



seal an outer casing forming such air chamber adapted to be raised and lowered and dipping into said water seal, an upper water seal, an inner flange at the top of said casing dipping into the upper seal, and means for raising and lowering said outer casing, said casing having a contracted bottom which when the said casing is in its lowest position rests on the support in the water seal at a sufficient distance above the bottom of the same to allow of the ashes being removed without raising said casing, substantially as set forth.

3. In a gas producer, the combination of the grate having the shape of a section of an inverted cone or pyramid a water seal below the same, an outer casing surrounding the grate and adapted to be raised and lowered

and dipping in said seal, means for raising and lowering said outer casing, an upper water seal, an inner flange at the top of the casing dipping into said upper water seal so that the interior of the casing forms a practically inclosed air tight blast chamber for supplying air under pressure to the grate, and a support above the bottom of the bottom water seal on which the bottom of the casing rests when in its lowest position, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE HATTON.

Witnesses:

CHARLES BOSWORTH KELLEY,  
THOMAS JOHN ROWE.