

No. 674,888.

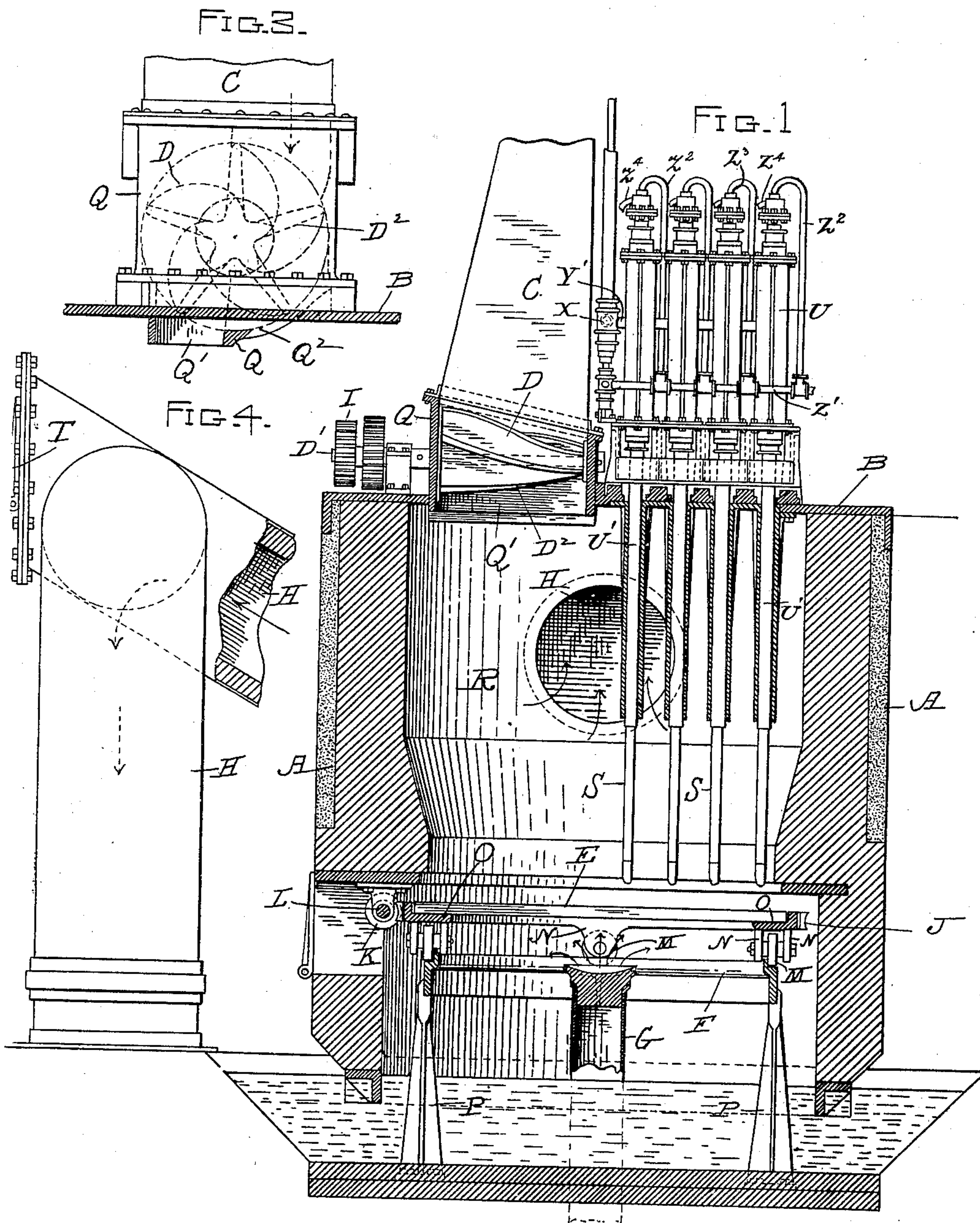
J. O. E. TROTZ.
GAS PRODUCER.

Patented May 28, 1901.

(No Model.)

(Application filed Nov. 8, 1900.)

2 Sheets—Sheet 1.



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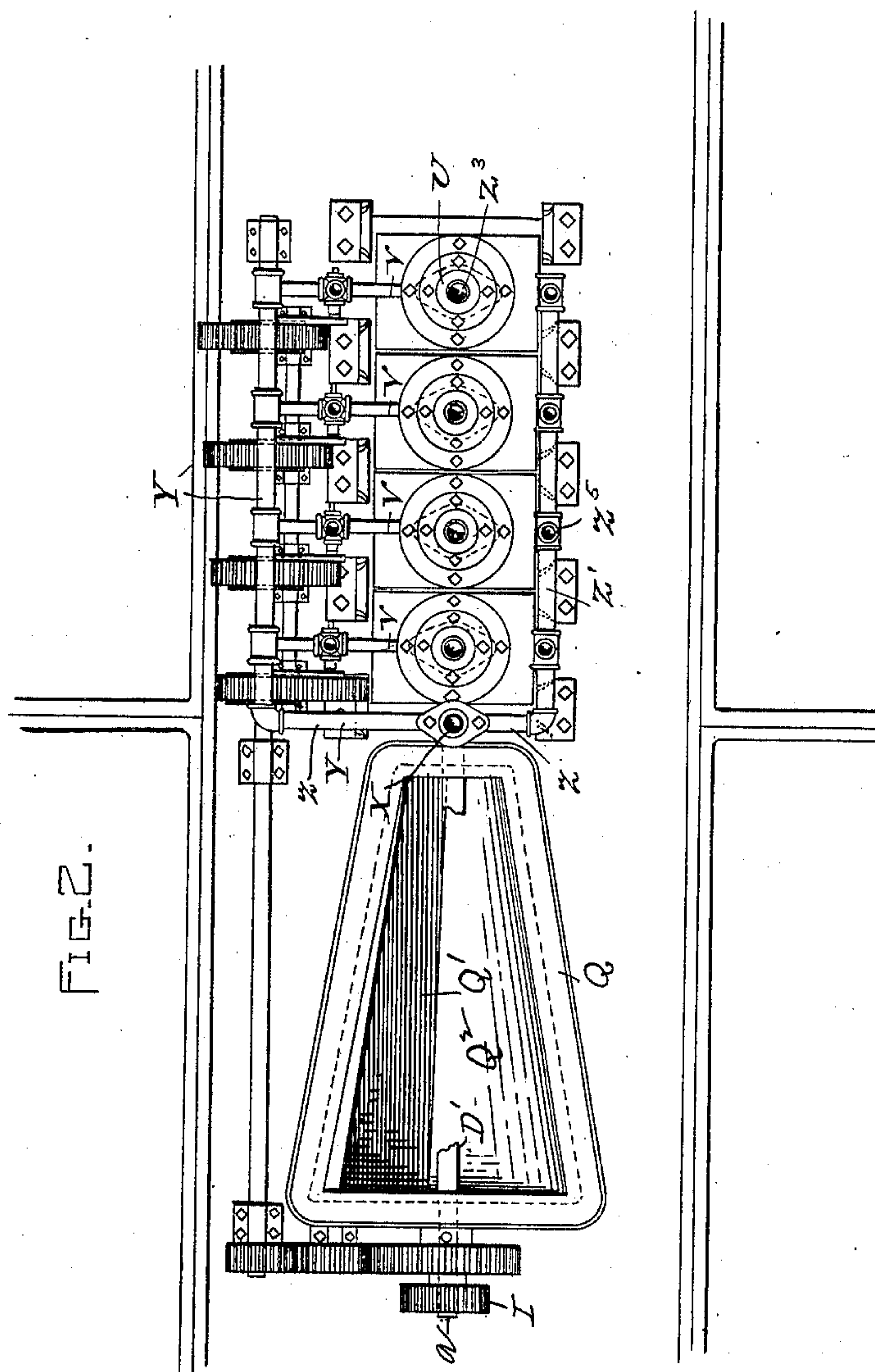
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UNITED STATES PATENT OFFICE.

JOHAN OTTO EMANUEL TROTZ, OF WORCESTER, MASSACHUSETTS.

GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 674,888, dated May 28, 1901.

Application filed November 8, 1900. Serial No. 35,781. (No model.)

To all whom it may concern:

Be it known that I, JOHAN OTTO EMANUEL TROTZ, of the city and county of Worcester, in the State of Massachusetts, have invented
5 certain new and useful Improvements in Gas-
Producers; and I do hereby declare that the
following is a full, clear, and exact description
thereof, reference being had to the accompa-
nying drawings, forming a part of this speci-
10 fication, and in which—

Figure 1 represents a central vertical sec-
tion, partly in elevation, of a gas-producer
embodying my improvements, said section
being taken at the point indicated by line *a*
15 in Fig. 2. Fig. 2 represents, upon an enlarged
scale, a top or plan view of the parts of the
producer to which my improvements relate,
the coal-distributor being removed in this fig-
ure. Fig. 3 represents, upon the same en-
20 larged scale as Fig. 2, a vertical section taken
just in front of the inner end of said coal-dis-
tributer, showing in dotted lines an end view
of the distributor; and Fig. 4 is a side view of
the duct through which the gas discharges
25 from the producer.

The object of my invention is to provide a
gas-producer whereby the coal may be depos-
ited evenly and of a uniform depth over the
entire grate-surface; and it consists in com-
30 bining with a producer having a rotary grate
and a suitable duct for conducting the gas
therefrom, and also a stationary cover, a
horizontal radially-arranged rotary coal-dis-
tributer mounted on a shaft, in turn mounted
35 on said stationary cover, means for rotating
said distributor, and a box or receptacle con-
nected with the coal-chute and in which said
distributor is arranged, said distributor be-
ing provided with radial helical-shaped blades
40 narrower at their inner than their outer ends,
and the box or receptacle being provided with
an inner curved surface, upon which the coal
is deposited and between which and the afore-
said blades pockets are formed of small ca-
45 pacity at their inner ends and gradually in-
creasing in capacity toward their outer ends,
said box or receptacle also having a discharge-
opening, all as will be hereinafter more fully
set forth.

50 To enable those skilled in the art to which
my said invention appertains to better under-

stand the nature and purpose thereof, I will
now proceed to describe it more in detail.

In the drawings, A represents the vertical
walls of the producer; B, the stationary cover 55
thereof; C, the coal-chute; D, the coal-dis-
tributer; E, the rotary grate; F, the track
upon which said grate turns; G, the blast-
pipe for introducing the fresh air under the
grate, and H the duct for discharging the gas 60
from the producer.

The distributor D is mounted upon a hori-
zontal shaft D', fitted to turn in suitable sta-
tionary bearings, and said shaft is in turn
operated in practice by suitable mechanism 65
operatively connected therewith. In the
drawings I have shown a gear I secured to
the outer end of said shaft D', with which
said driving mechanism may be connected.
As said mechanism does not constitute a part 70
of my invention, it is deemed unnecessary to
illustrate or describe the same.

The rotating grate E, which may be of or-
dinary construction, is provided with an an-
nular toothed rack J around its periphery, 75
which engages with an ordinary worm-gear
K, mounted on a horizontal shaft L, fitted to
turn in suitable stationary bearings. Said
shaft L may also in practice be turned by any
suitable driving mechanism connected there- 80
with. The grate E is provided with a series
of antifriction-wheels M, fitted to turn in sui-
table bearings N N on the grate-frame O and
to travel upon the horizontal circular track
E, which is mounted on the supporting-stand- 85
ards P. In practice the grate is designed to
be turned with a continuous slow rotary mo-
tion as the coal is deposited thereon from the
distributor D, the combined rotary move-
90 ments of said grate on its track and said dis-
tributer with its shaft causing a very even
distribution of the coal and of uniform depth
over the whole grate-surface, as will be here-
inafter more fully described.

The distributor, as will be understood from 95
the foregoing description, turns in stationary
bearings, while the grate upon which the coal
is deposited therefrom rotates slowly during
the process of distribution. It will also be ap-
parent that since said coal is deposited in cir- 100
cles by the rotation of the grate and since the
diameter of the grate-surface increases from

the center out a proportionate amount of coal, increasing from the center to the outside of said grate-surface, must be deposited thereon to evenly distribute the same over its whole surface, or, in other words, the coal must be deposited in greater quantities and more rapidly at the outer edge of the grate-surface on account of the greater diameter or circular distance to be traversed and covered than at points nearer the center. In order that the distribution of coal may be thus graduated from a light deposit near the center of the grate-surface and gradually increasing in volume to the outer edge thereof, I make the radial longitudinal webs or blades D^2 of the distributor narrow at their inner ends, at or near the vertical center of the producer, and gradually increasing in width from said point to the outer ends thereof, thus forming pockets for the reception of the coal discharged from chute C between said webs or blades very shallow at the inner end of the distributor and increasing in depth and capacity toward the outer end thereof, as is shown in the drawings. By the described construction it is obvious that the coal as it is discharged from chute C onto the distributor is in turn discharged from said distributor onto the grate-surface in gradually-increasing quantity from the center to the outside of said grate-surface, and in consequence an even distribution or deposit of uniform depth is constantly maintained over the entire grate-surface. To facilitate said uniform distribution, the blades D^2 of the distributor are helical-shaped, as is shown by full lines, Fig. 1, and dotted lines, Fig. 3, and a cone-shaped box or receptacle Q is formed at the bottom of the coal-chute C, in which the distributor is arranged, said receptacle being made to conform to the general contour of the distributor and provided with an opening Q' at the bottom for the discharge of the coal therefrom into the combustion-chamber R of the producer. The coal is not discharged directly from the distributor into the producer, but is first deposited on the bottom curved surface Q^2 of the receptacle Q and from there pushed by the blades D^2 of the distributor into the producer-chamber. The coal discharged from chute C onto said distributor lies in the pockets thereof between its helical-shaped blades D^2 and the aforesaid inner circular surface Q^2 of receptacle Q until the edge of each blade arrives at the discharge-opening Q' , when it is gradually pushed by the rotation of the distributor from said surface Q^2 into the combustion-chamber of the producer, as aforesaid. The radial blades D^2 being helical-shaped and arranged as previously described, one part of one blade will be pushing the coal from a certain point on the surface Q^2 , while another part of another blade will at the same time be pushing said coal from another point on said surface. Said blades of the distributor and the receptacle Q are in practice so constructed and arranged

in relation to each other that a constant even discharge is maintained throughout the length of the distributor, with a gradual increase in quantity, of course, as previously described, from the inner to the outer end of said distributor. Assuming that one of the inner narrow ends of one of the blades D^2 arrives at the opening Q' , the spiral or helical shaped edge thereof at once commences to push the thin layer of coal at said end through said opening, and as the distributor continues to rotate the edge of a still wider and wider part of the blade arrives at the opening, and consequently a gradual increase in the discharge of the coal is effected, as aforesaid. Before the edge of each blade at its outer end or widest part has passed by the opening Q' the inner narrow end of the next succeeding blade has come into action for discharging the coal, and consequently a constant and uniform discharge is maintained, as also previously stated. While the coal is being thus deposited over the rotating grate-surface it is necessary in order to obtain a perfect combustion thereof to poke said coal in some manner while it is being thus deposited. This operation has commonly been done by the attendants by hand, although some mechanical devices have been employed for this purpose. In my improved producer I propose in practice to do said poking mechanically and by automatic mechanism connected with the pokers S. Said pokers and their operating mechanism constitute the subject-matter of a separate application, and it will therefore be unnecessary to give more than the following general description thereof to make clear the purpose and advantages of my present invention.

Vertical intermittent reciprocating movements are imparted to the pokers S by means of the vertically-arranged pneumatic cylinders U, which are arranged in line radially to the vertical center of the producer, each poker being an extension of the piston U' of each cylinder and each is operated independently and at different speeds by mechanism substantially alike. The cylinders and their pokers being arranged in a radial line, as aforesaid, it is obvious that the circumference of the circle which each acts upon as the grate rotates increases from the inner to the outer one. Therefore the inner pokers do not have to be operated as many times in each rotation of said grate as the outer ones in poking the coal at equal distances apart and are therefore operated at longer intervals between each downward stroke than said outer ones. The speed of the stroke itself may be the same for all of them; but the interval between said strokes must be reduced less and less in proportion to the increase in the circumferential distance that each poker has to act upon the grate at each revolution of said grate, each poker being designed to punch the coal the same distance apart—about one foot apart in practice. The pokers are ar-

ranged to be thus operated in the following manner: Pneumatic pressure is applied to each separate cylinder U to operate its respective piston U' and poker S by means of the conducting-pipes V, which may be connected with any suitable source of supply. In this instance it is shown as being supplied from a combined air and water pipe, comprising the inner water-pipe W and the outer air-pipe W', having a distributing device X combined therewith, into which the air and water flows and is distributed, the air through the pipe Y to a pipe Y', with which the pipes V connect, and the water through a pipe Z to a pipe Z', from which connection is made by rubber tubing Z² with the upper end of a pipe Z³, which in practice extends down through each piston and poker to cool the same, the water thus introduced flowing up and out at the top through the discharge-pipe Z⁴.

The supply of air and water to the cylinders for independently operating their pistons and the pokers at different speeds, as and for the purpose previously described, may be regulated in various ways, and as I make no claim thereto it is deemed unnecessary to describe the same.

In my application filed June 18, 1900, and bearing Serial No. 20,625, the duct for conducting the gas from the producer is arranged in line with the pokers and extends downward from the exit-opening of the producer; but in this instance it is shown at right angles to the pokers S and first extends upward and then downward, the object thereof being to direct the gas-flames laterally across the pokers instead of in line therewith and to retard the products of combustion passing off through the discharge-duct. The interior of said duct may be reached to clean the same by means of a door T. (Shown in Fig. 4.)

The object of this invention is to cover certain improvements upon a coal-distributor mounted upon a rotating cover and used in connection with a stationary grate, covered in said separate application, filed June 18, 1900, and bearing Serial No. 20,625. By the construction herein set forth of mounting the distributor on a stationary cover and using a rotary grate therewith considerable saving in the cost of construction is effected, and it is also thought that by depositing the coal from a stationary distributor onto a movable grate a better combustion is effected, less poking being required, as the rotary movements of the grate tend more or less to shake and change the position of the coal deposited

thereon. Consequently a better combustion is maintained than by the use of a stationary grate, as in the producer set forth in my said previously-filed application, and therefore a superior quality of gas is produced.

Having now described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. In a gas-producer, having a rotary grate and stationary cover, the stationary coal-chute and the receptacle at the bottom thereof, mounted on said stationary cover, and having a cone-shaped interior, also provided with a discharge-opening at the bottom and a curved surface to hold the coal until pushed therefrom by the blades of the distributor through said opening into the producer-chamber, in combination with the rotary, cone-shaped distributor arranged in said stationary receptacle over said discharge-opening, and provided with a series of radial, helical or spiral shaped blades made narrower in width at their inner than their outer ends, and with the edge of one end of each blade substantially in longitudinal alinement with the edge of the opposite end of the next adjoining blade, substantially as and for the purpose set forth.

2. In a gas-producer having a rotary grate, the body, the gas-discharge duct opening from the side thereof and inclined upward for a short distance before connecting with the main duct and provided with a clean-out door, the stationary cover, the stationary coal-chute, the receptacle at the bottom thereof mounted on said stationary cover and made cone-shaped on the interior, also provided with a discharge-opening at the bottom and a curved surface to hold the coal until pushed therefrom by the blades of the distributor through said opening into the producer-chamber, in combination with the rotary, cone-shaped distributor, arranged in said stationary receptacle over said discharge-opening, and provided with a series of radial, helical or spiral shaped blades, made narrower at their inner than their outer ends and with the edge of one end of each blade substantially in longitudinal alinement with the edge of the opposite end of the next adjoining blade, substantially as and for the purpose set forth.

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Witnesses:

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