

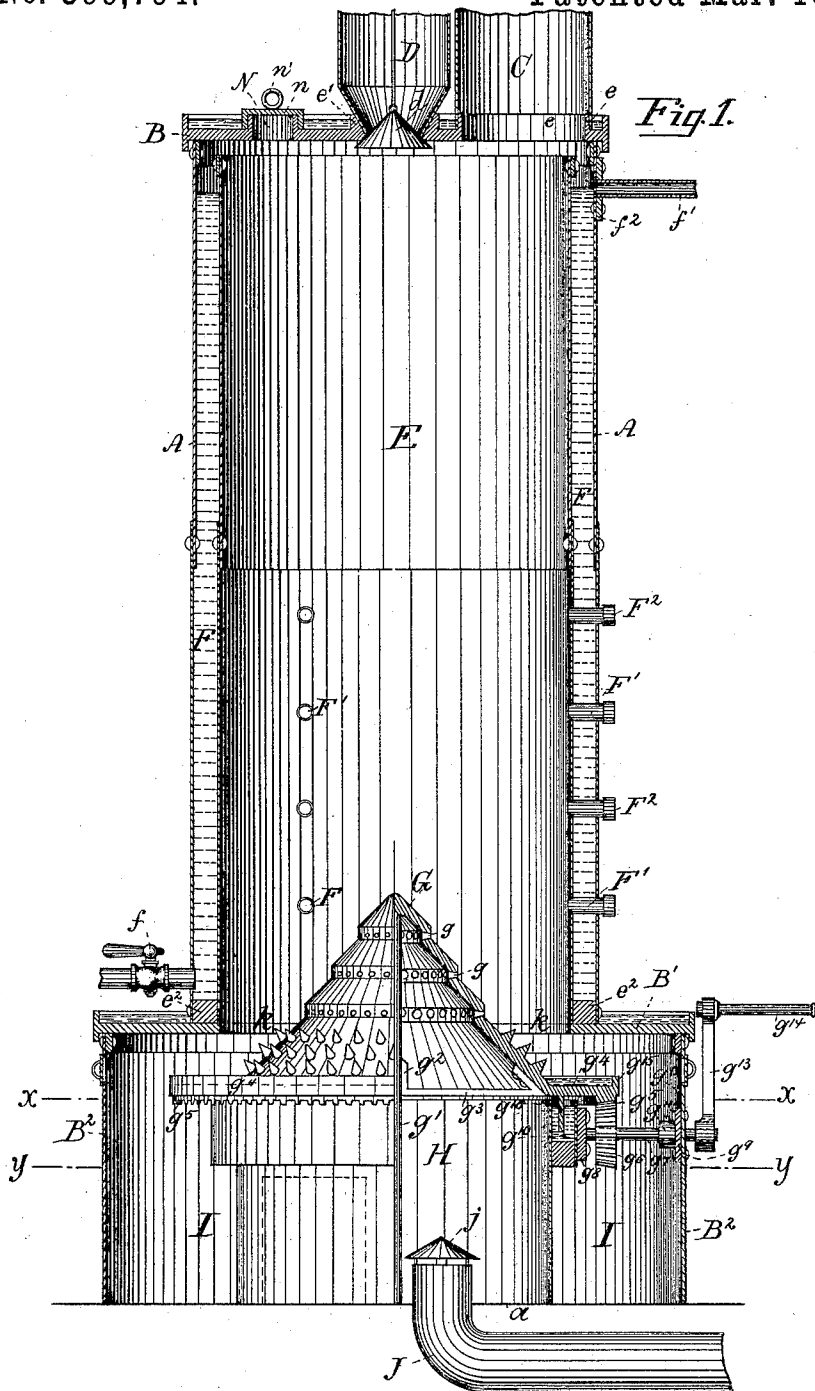
(No Model.)

2 Sheets—Sheet 1.

W. J. TAYLOR.
GAS PRODUCER.

No. 399,794.

Patented Mar. 19, 1889.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 399,794, dated March 19, 1889.

Application filed May 2, 1887. Serial No. 236,746. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. TAYLOR, of Chester, in the county of Morris and State of New Jersey, have invented certain new and useful Improvements in Gas-Producers, of which the following is a specification.

My invention relates to certain novel features in the construction of a gas-producer of the type, for instance, forming the subject-matter of an application for a patent filed by me under date of December 31, 1886, Serial No. 223,112.

The principal object of my present invention is to construct a gas-producer so that a uniform distribution of air or steam and air under pressure may be imparted to the fuel in the combustion-chamber for effecting a complete combustion thereof, for obviating sticking or clinkering of non-combustible matter to the wall of the combustion-chamber, and for readily and effectively removing ashes or other non-combustible matter accumulating therein while in full operation and without stopping the producer.

The nature and scope of my invention will be fully understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 is a vertical central section through a metallic water-cooled gas-producer of my improved construction, and Figs. 2 and 3 are respectively transverse sections of the same on the lines *x x* and *y y* of Fig. 1.

Referring to the drawings, A is the metallic shell or main casing, cylindrical in form, having a double-flanged iron top plate, B, and so constructed and arranged that a receptacle is formed for containing a supply of water for preventing the heat of the producer from affecting it and the other parts attached thereto.

C is the gas-flue exit-pipe fitting around the annular rim *e*, cast with the flanged top plate, B.

D is the bosh-shaped feed-hopper fitting snugly against the inner flaring annular ring, *e'*, of the top plate, B.

d is a bell for closing the hopper after the fuel has been supplied to the central combustion-chamber through the top thereof, and which fits snugly up against the throat of the

hopper, and which is operated in any suitable manner.

In the annular dish-shaped top plate, B, is provided one or more sight-openings, N, having covers *n*, with eyes *n'* cast therewith for handling them, and which covers may be readily removed for ascertaining the condition of the fuel or for examining the upper part of the producer for whatever purpose it may become necessary.

E is a metallic inner shell or combustion-chamber made of plate or boiler iron, preferably in sections riveted together and of a uniform diameter from the bottom to the top. The bottom of the metallic combustion-chamber E and main casing A are both riveted to a rectangular ring, *e''*, and are supported upon a double-flanged plate, B', carried upon the casing of the cylindrical ash-pit B².

F is a space or jacket between the main casing A and the combustion-chamber E, for containing a supply of water admitted through a pipe having a stop-cock, *f*, and which pipe is fitted into the main casing A near the bottom thereof, and the water or condensed steam and water discharged from the water-jacket near the top of the main casing through an overflow-pipe, *f'*, suitably supported by and firmly held in position by a strengthening-plate, *f''*, riveted or otherwise fastened to the main casing A.

F' is a series of cylindrical tubes arranged around the wall of and extending through the main casing A and into the metallic shell of the combustion-chamber E and supported thereby, and which tubes are designated as "peep-holes" for examining the different zones of incandescence of the fuel in the central combustion-chamber, E. These peep-holes F' are provided with caps F², of any suitable construction, and may be readily and quickly removed for examination of the interior for whatever purpose desired.

G is a dome-shaped revolving bottom made of cast-iron or other suitable metal with a series of narrow interstices or preferably narrow inverted-V-shaped openings *g* therein, for the free passage therethrough of air or steam and air admitted by forced draft or otherwise through an underground conduc-

tion-pipe, J, having a hood, j , and which con-
duction-pipe J is rigidly held to place in the
base-plate a , to which the wall of the main
casing is riveted. This pipe J extends verti-
cally into a cylindrical chamber, H, supported
in the base of the ash-pit I. The volume of
air or steam and air discharged into this
chamber H is uniformly distributed through
the openings g of the revolving bottom into
contact with the fuel in a more or less state
of incandescence for effecting a complete com-
bustion thereof.

The dome-shaped revolving bottom G con-
sists of a series of hollow frustums of cones
cast together and the bottom so constructed
and arranged that the space between each
frustum forms a ring having a series of nar-
row interstices, g , therein for the passage of air
or steam and air admitted directly into the in-
terior of the bottom, the contour of this bot-
tom in appearance being that of broken
straight lines slanting from the apex to the
base thereof, and arranged at suitable dis-
tances apart. Around the lower exterior sur-
face of the bottom and cast therewith are pro-
jecting triangular points, which serve to grind
up any clinker passing downward through
the throat k of the combustion-chamber E.
This dome-shaped revolving bottom is sup-
ported centrally in position by means of a
vertical post, g' , secured in any suitable man-
ner in the base-plate of the sealed ash-pit I.
This revolving bottom G is held in position to
the post g' by means of a sleeve, g^2 , having
four horizontal arms, g^3 , which are riveted to
the interior surface of the bottom for obviat-
ing any rocking movement of the bottom G,
supported centrally by the post g' .

The revolving bottom G is provided with a
shallow trough, g^4 , for containing a supply of
water, supplied thereto in any convenient
manner. Upon the under side of this trough
is a ratchet-surface, g^5 , and meshing there-
with is a cog-wheel, g^6 , supported upon a hori-
zontal shaft, g^7 . This shaft g^7 is held in bear-
ings in strengthening-plates g^8 and g^9 , respec-
tively riveted to the wall of the water-seal g^{10}
and metallic wall B^2 of the ash-pit I, around
which shaft is fitted a collar, g^{11} , provided
with a set-screw, g^{12} , for properly holding the
shaft in its bearings in the strengthening-
plate g^8 . This horizontal shaft g^7 is provided
with a crank, g^{13} , having an operating-handle,
 g^{14} , for revolving the dome-shaped bottom
around and around, and thereby breaking up
the clinker and carrying the same, more or
less broken up, together with the ashes, over
the outer periphery of the same into the
cylindrical sealed ash-pit I. The revolving
bottom G is provided with an annular rim, g^{15} ,
for keeping the water from running over the
peripheral surface thereof. The clinker drop-
ping downward through the throat k of the
combustion-chamber, between the revolving
bottom into the trough thereof, is thus cooled
off, together with the ashes, preparatory to
their precipitation into the annular sealed ash-

pit I beneath, when the bottom G is revolved
around and around by the attendant in charge.
Cast with the revolving bottom G is an annular
depending flange, g^{16} . To the wall of the air or
steam and air blast-receiving chamber H is
suitably formed an annular-channel, g^{10} , kept
supplied with water from any suitable source,
and which is designated as a "water-seal," into
which the depending flange g^{16} is kept more
or less immersed, and which water-seal, while
keeping the underneath portions of the bot-
tom cool, at the same time prevents the air or
steam and air under pressure in the cylin-
drical blast-chamber H from being diverted
from its natural course through the interstices
of the bottom G.

The revolving bottom G should necessarily
be diametrically so proportioned to the throat
 k of the combustion-chamber E, and at such
distance therefrom, that the superimposed in-
candescent mass of fuel will be supported
thereby and clinkers and ashes passing down-
ward between the throat and the bottom main-
tained upon the trough g^4 of the revolving
bottom until discharged over the outer pe-
riphery thereof into the closed ash-pit I by
the operation of the handle of the crank g^{13}
around and around or backward and forward.

In the main casing A and the air or steam
and air blast-chamber H are provided one or
more doors suitably hinged to the respective
metallic walls, as shown in dotted lines in
Fig. 1, and which are preferably made large
enough to admit a person for cleaning out the
ashes in the ash-pit I and for whatever pur-
pose it may be found necessary to examine
into the interior of the blast-chamber.

The mode of operation of the metallic
water-cooled gas-producer hereinbefore de-
scribed may be briefly explained in the fol-
lowing manner: The fuel is fed into the cen-
tral combustion-chamber, E, through the feed-
hopper D by lowering the bell d a sufficient
distance, and when the proper quantity of
fuel has been supplied to the combustion-
chamber E the bell d is drawn upward snugly
against the throat of the hopper D, and the
air or steam and air by forced draft or other-
wise admitted through the conduction-pipe
J into the central chamber, H, and in a ver-
tical direction distributed radially, or nearly
so, through the interstices in the dome-shaped
bottom G into contact with the fuel in the
combustion-chamber E for effecting combus-
tion, and the gas arising from the combustion
of the fuel discharged through the exit-pipe
C in the top of the producer for utilization;
and whenever it shall become necessary dur-
ing the time that the producer is making gas
to remove the non-combustible matter the
bottom may be revolved by the attendant in
charge, and the ashes, together with the
clinker accumulating in the central combus-
tion-chamber, E, drawn downward between
the throat and the slanting surface of the
dome-shaped bottom into the trough g^4 and
discharged over the outer periphery, when the

bottom is actuated by the attendant in charge, into the cylindrical sealed ash-pit I without stopping the producer while regularly making gas.

5 In an application for Letters Patent, Serial No. 223,112, filed by me December 31, 1886, I have shown a conical-shaped bottom with a depending flange, *g*¹⁶, but the bottom proper is different in form from that shown and described in my present application; but in that
10 application, as in my present one, a central chamber having a channel around the upper portion of the same is shown, and the latter forming a receptacle for containing a supply of water, and, with the depending flange *g*¹⁶,
15 of the bottom forms what is designated as a "water-seal." A blast-pipe with a deflecting-hood and extending upward into said central chamber is also shown in said application; but notwithstanding such constructions have
20 been shown therein I have not claimed the water-seal with the central chamber and blast-pipe, as I have in this application.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A gas-producer having a chamber within

the ash-chamber thereof and a receptacle formed around the upper exterior portion of the casing of said chamber, in combination
30 with a blast-pipe extending upward into said chamber, a bottom with a flange projecting into said receptacle and forming a seal, a post supporting said bottom, and mechanism, as described, for rotating said bottom, substantially
35 as and for the purposes set forth.

2. The combination, in a gas-producer, of a conical-shaped bottom having radial rows of small openings therein and a flange formed therewith, a vertical post for supporting said
40 bottom, a chamber with a channel formed around the upper portion of the casing of said chamber, a pipe extending into said chamber, and mechanism, as described, for rotating
45 said bottom, substantially as and for the purposes set forth.

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

WM. J. TAYLOR.

Witnesses:

THOMAS M. SMITH,
HERMANN BORMANN.