

No. 697,399.

Patented Apr. 8, 1902.

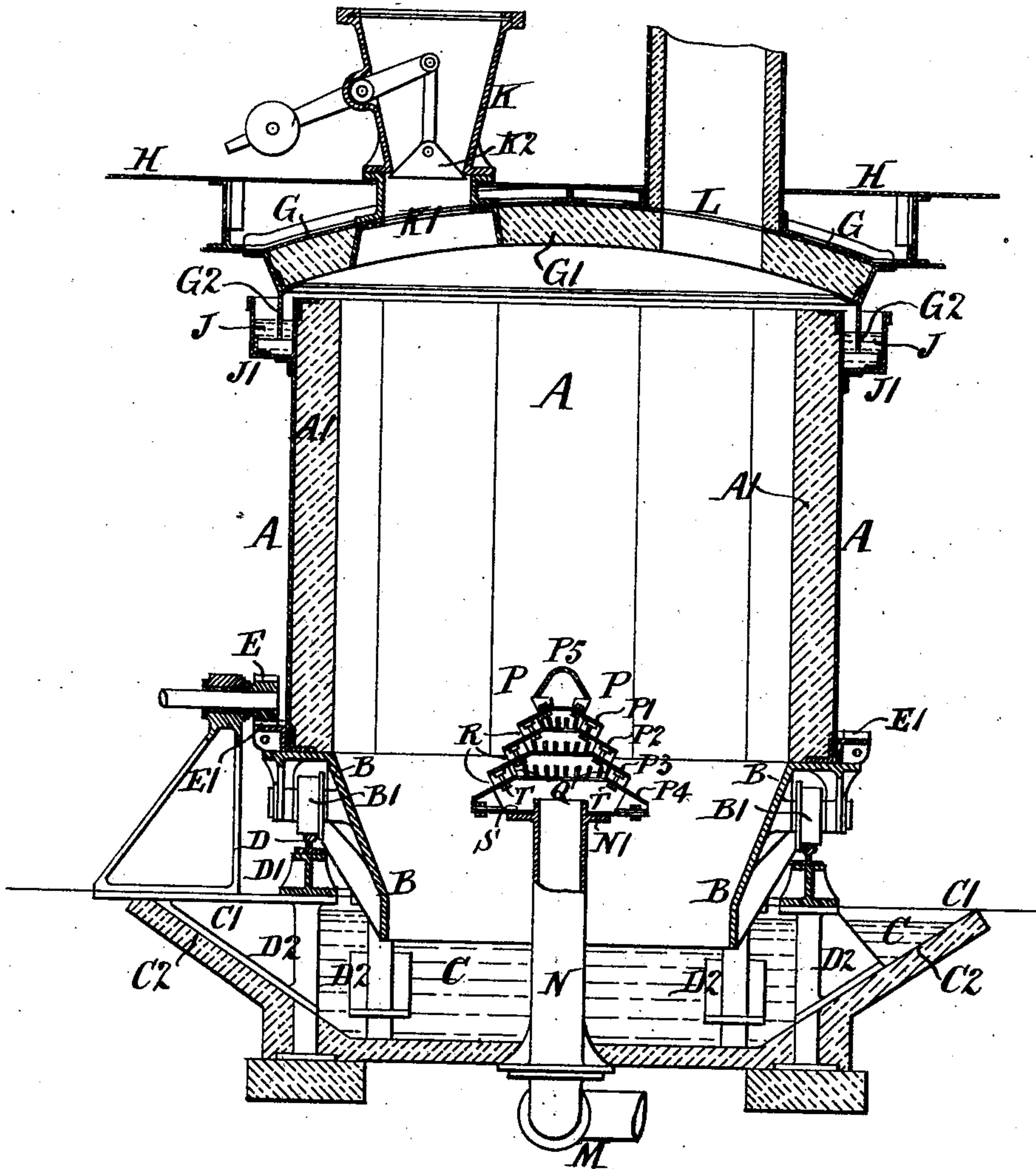
E. J. DUFF.
GAS PRODUCER.

(Application filed Aug. 23, 1901.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1



WITNESSES

Walter Abbe
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INVENTOR

Edward James Duff

BY

Horizon and Horizon
ATTORNEYS

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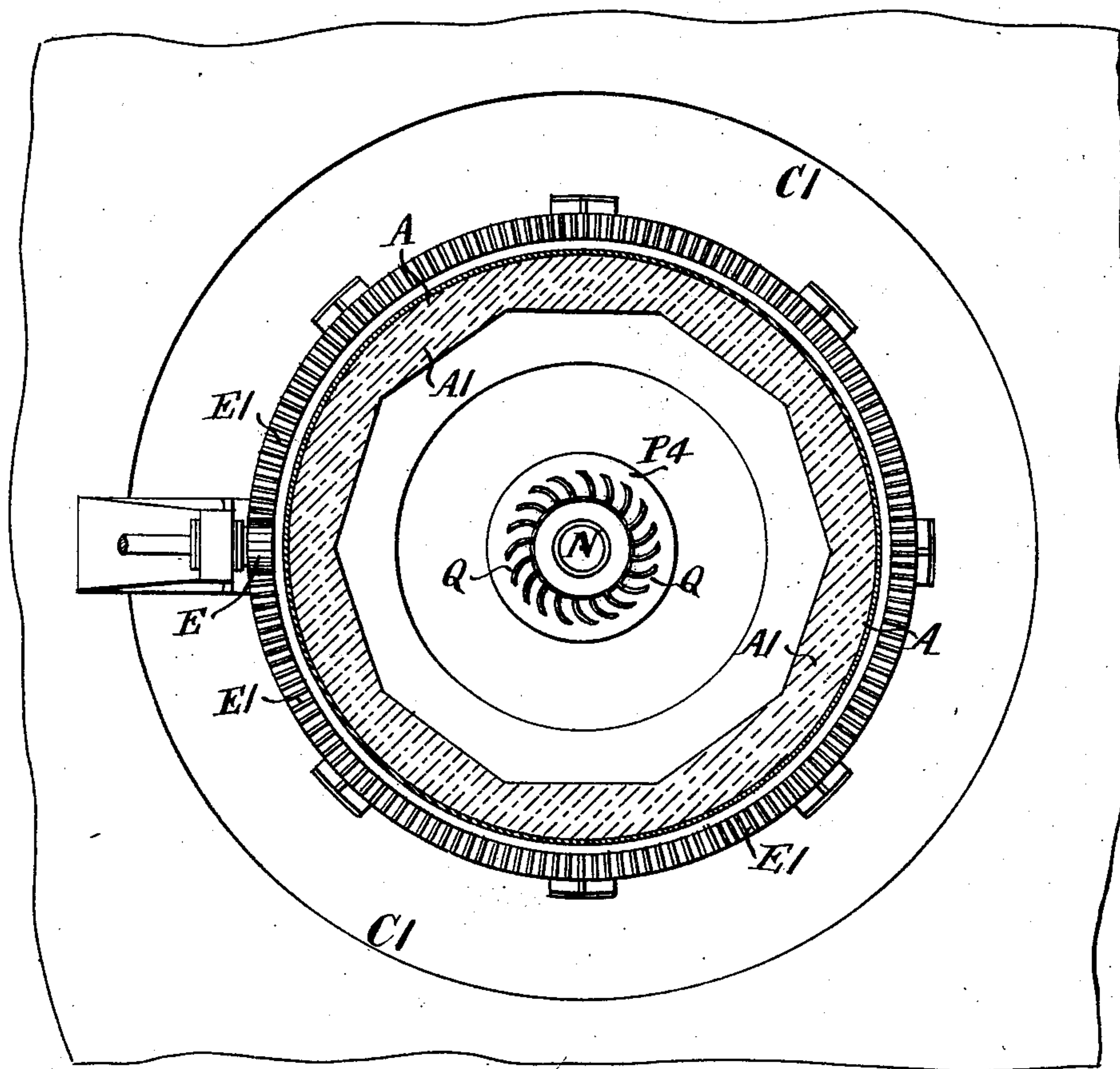
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2 Sheets—Sheet 2.

FIG. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

EDWARD JAMES DUFF, OF LIVERPOOL, ENGLAND.

GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 697,399, dated April 8, 1902.

Application filed August 23, 1901. Serial No. 73,057. (No model.)

To all whom it may concern:

Be it known that I, EDWARD JAMES DUFF, a subject of the King of Great Britain and Ireland, and a resident of Liverpool, in the county of Lancaster, England, (whose postal address is Holly Lodge, Cressington Park, Liverpool, England,) have invented certain Improvements in Gas-Producers, (for which application for British patent has been made August 2, 1901, No. 15,646,) of which the following is a specification.

My said invention has for its object to improve the construction of gas-producers so as to increase their efficiency and at the same time reduce the labor required in working them, the improvements being specially applicable where town's refuse and the like is used as fuel.

The improvements comprise a rotating shell or casing having an internal surface of polygonal or corrugated contour in plan or having inwardly-projecting parts on the internal surface, the shell having a lower depending part dipping into a water-sealed ash-trough, the upper end of the casing being closed by a cover suspended from the charging-platform, a depending annular plate on the cover dipping into a liquid seal arranged around the top edge of the casing, the usual charging-box and gas-outlet being arranged on the cover.

The improvements also comprise a blower-piece or air-distributing nozzle which is fitted to a pipe in the lower part of the producer, the blower-piece consisting of a series of sloping annular plates arranged to overlap each other louver-board fashion, curved vanes being interposed between the plates, which in some cases may be of other than annular form.

In order that my said invention and the manner of performing the same may be properly understood, I hereunto append two sheets of explanatory drawings, to be hereinafter referred to in describing the improvements.

Figures 1 and 2 of the drawings are respectively a vertical section and a horizontal section of the improved gas-producer.

In the drawings the same reference-letters are used to mark the same or like parts wherever they are repeated.

According to the invention the improved gas-producer consists of an upright shell or

casing A, lined with fire-brick A' and fixed at its lower end to a depending tapered metal piece B, which dips into a water seal C in an ash-trough C', formed with sloping sides C². The depending piece B is provided with rollers or wheels B', arranged to travel on a circular rail D, fixed to a beam D', fixed to supporting-pillars D². With this arrangement the fire-brick casing A, with its depending piece B, can thus be turned around, the parts being rotated by means of a driving-pinion E, arranged to act on a circular toothed rack E', fitted around the shell A, or rotation may be imparted by any other suitable means.

The casing A is provided with a metal cover G, having an inner lining G' of fire-brick, the cover being fixed to or suspended from the charging-platform H, so that it does not interfere with the rotation of the vertical casing A. The cover G is formed with a depending spigot part G², which dips into a suitable liquid J in a trough J', arranged around the upper end of the casing. By this means the vertical casing A is thus sealed or closed at its upper end. A fuel-charging box K is fitted to an inlet K' on the casing-cover G, the opening at the bottom of the box being controlled by a weighted plug or valve K², or any other suitable known means of charging the fuel may be employed. The gas escapes from the producer by an outlet L, also formed on the casing-cover G. Air for combustion or gasification is led from a suitable blowing apparatus to the fire or fuel bed by pipes M, connected to a stand-pipe N, arranged in the lower part of the producer, the pipe extending up some distance into the depending tail-piece B of the vertical shell A. The stand-pipe N is formed with a flange N' at its upper end, and on this flange is mounted a cone-shaped blower-piece or air-distributing nozzle P, consisting of a series of sloping annular plates P¹ P² P³ P⁴, overlapping each other louver-board fashion, curved vanes Q, being arranged all around the annular openings or outlets R thus left between the plates. The bottom ring P⁴ (shown in plan in Fig. 2) is fixed to a perforated plate S, fixed to the stand-pipe flange N'. All the rings composing the blower-piece P are preferably fixed to each other by screw-bolts T, the curved

vanes Q acting conveniently as distance-pieces between the rings, the openings R between the rings being made comparatively wide. The blower-piece P is surmounted by
5 a cap or cover P⁵, which is fixed to the top ring P'.

The action of the apparatus is as follows: After the producer has been charged with fuel through the charging-box K the vertical
10 shell A is turned slowly around, and this slow rotating movement, combined with the polygonal contour of the lining A' of the shell A, has the effect of twisting the fuel-bed so as thereby to break it open, and thus feed the
15 fuel down to the blower-piece or air-distributing nozzle P in an open condition. The air issuing from the blower-piece P is thus allowed to distribute itself freely and uniformly through the fuel, so that a rapid rate of gasifi-
20 cation is thereby obtained. The curved vanes Q on the blower-piece P act as baffles and impart a swirling or circular movement to the air as it issues from the blower-piece, and thereby prevents the issuing air from being too
25 directly and forcibly blown upon the lining A' of the producer, likewise also preventing the formation of adhering clinker as well as the overheating of the shell-plates. The improved blower-piece P is thus better adapted
30 for the more rapid rate of blowing required to meet the greater rate of gasification.

The hereinbefore - described automatic method of breaking up the fuel in the producer dispenses with the ordinary laborious
35 process, in which long iron rods worked by hand are used for stirring and breaking up the fuel-bed. The automatic process is, besides, much more efficient, as the automatic breaking-up action is non-intermittent, and
40 the fuel generally is also more thoroughly stirred or broken up, so that any caking or clinkering difficulties in connection with the fuel are thereby effectually prevented.

What I claim as my invention is—

1. A gas-producer having an upright rotat- 45 ing shell of polygonal cross-section internally and means for rotating it, and an ash-trough below it, substantially as described.

2. Improvements in gas-producers comprising a rotating shell or casing the contour of 50 the internal surface of which is polygonal in plan, the shell having a lower depending piece dipping into a water-sealed ash-trough, the upper end of the shell or casing being closed by a cover suspended from the charging-plat- 55 form, a depending annular plate on the cover dipping into a liquid seal in a trough encircling the top end of the casing, substantially as and for the purposes herein set forth.

3. Improvements in gas-producers having 60 a rotating shell of polygonal cross-section internally and provided with a water-sealed ash-trough, a liquid seal and cover-piece being arranged in connection with the upper end of the casing, substantially as and for the pur- 65 poses herein set forth.

4. Improvements in gas-producers comprising a rotating shell or casing the contour of the internal surface of which is other than 70 circular in plan, the casing being provided with a water-sealed ash-trough, and a liquid seal and cover-piece being arranged in connection with the upper end of the casing, substantially as and for the purposes herein set forth. 75

5. A gas-producer having an upright shell of polygonal cross-section internally and means for rotating it, with a water-sealed ash-trough and a cover-piece, substantially as described.

In testimony whereof I have signed my 80 name to this specification in the presence of two subscribing witnesses.

EDWARD JAMES DUFF.

Witnesses:

EDWARD SCOTLAND,
RALPH GIBBS.