

No. 661,445.

Patented Nov. 6, 1900.

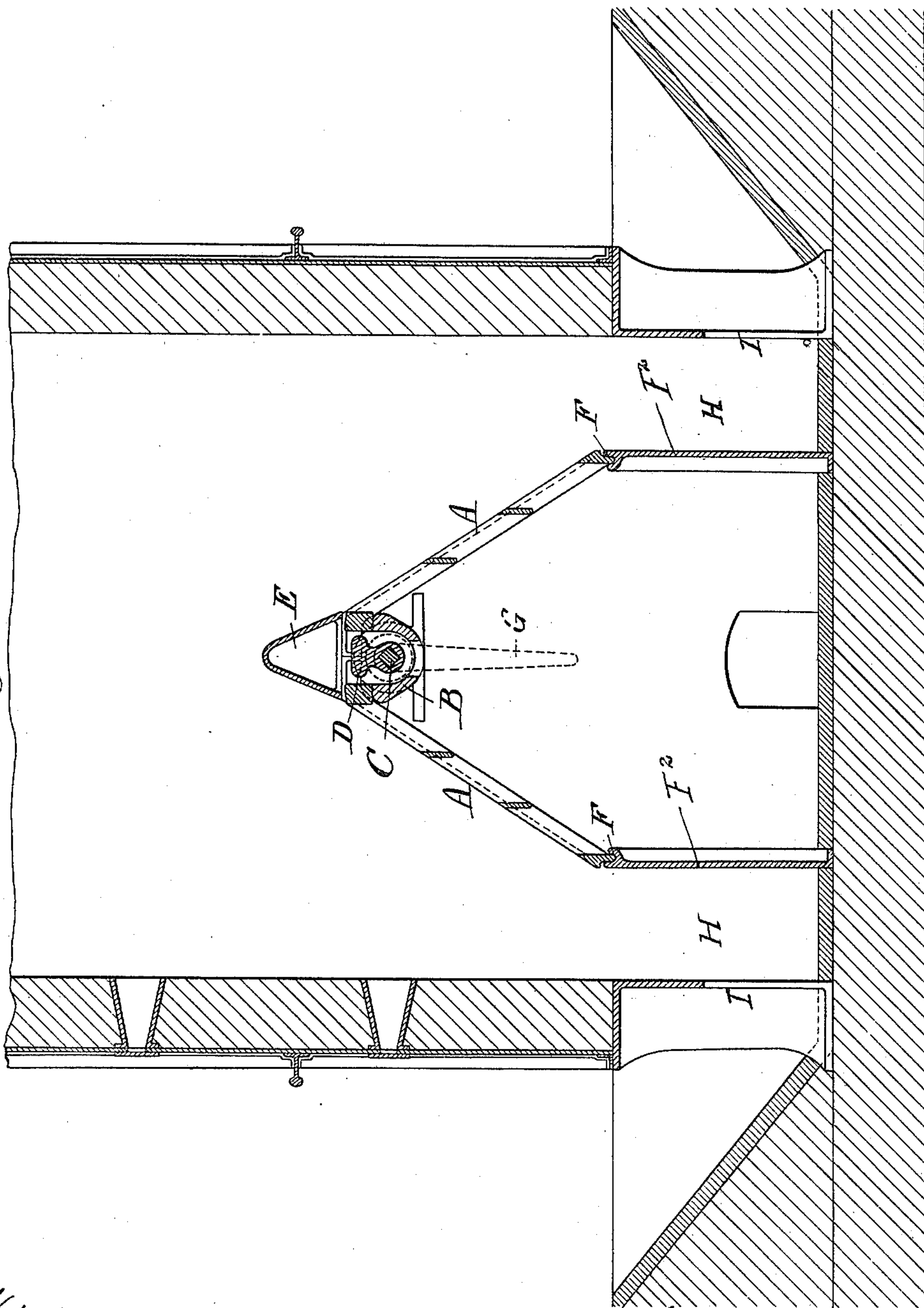
E. J. DUFF.
GAS PRODUCER.

(Application filed Feb. 16, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses:
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Inventor
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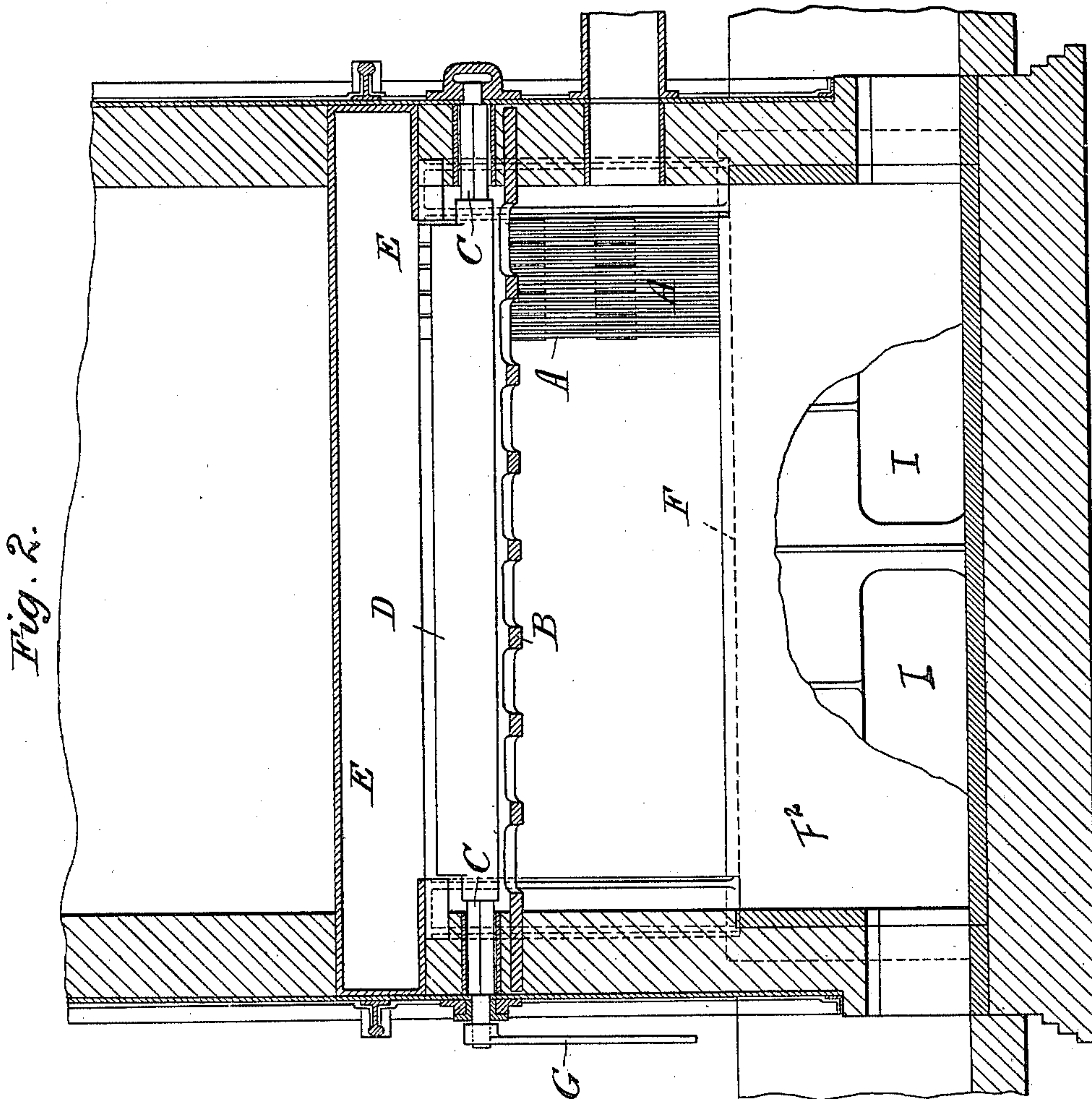
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2 Sheets—Sheet 2.



Witnesses:
 Geo Lewis
 W B Frankum.

Inwitness
Edward James Suff.
by Philip Mauro
his Atty.

UNITED STATES PATENT OFFICE.

EDWARD JAMES DUFF, OF LIVERPOOL, ENGLAND, ASSIGNOR OF ONE-HALF
TO THE UNITED ALKALI COMPANY, LIMITED, OF SAME PLACE.

GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 661,445, dated November 6, 1900.

Application filed February 16, 1900. Serial No. 5,519. (No model.)

To all whom it may concern:

Be it known that I, EDWARD JAMES DUFF, a subject of the Queen of Great Britain and Ireland, and a resident of 30 James street, Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in or Connected with Gas-Producers, (for which British Letters Patent have been applied for, No. 18,581, dated September 14, 1899,) which invention is fully set forth in the following specification.

This invention relates to the grates of gas-producing apparatus, and more particularly to those of the type of gas-producer described in the specification of British Letters Patent No. 7,467 of 1893.

In gas-producing, where a considerable amount of steam is employed, which is necessary where ammonia recovery is desired, blockage is liable to occur owing to a tendency of the fine dust from the ashes to cake on the bars of the grate.

This invention provides means whereby such blockage can be removed without interfering with the operations going on in the producer and without the necessity for opening the producer by the removal of manhole-covers or the like, as hitherto has been necessary. The arrangement as hereinafter described also prevents air from getting up at the sides of the charge, so as to reach the upper part and consume the gas, and it also enables the furnace to be worked continuously by withdrawing spent fuel at bottom as fresh fuel is introduced from above.

According to this invention a hammer or a series of hammers is manipulated (which can be done by a lever outside the producer) so that sufficient movement is given to the bars to break up and dislodge any caked material.

The accompanying drawings represent an arrangement in accordance with this invention.

Figure 1 is a transverse vertical section, and Fig. 2 a longitudinal vertical section.

The bars A of the grate are connected so as to form grids, which are inclined to each and constitute a grate of inverted-V form. The upper edges of the said grids lie against the bearing B, in which the spindle C, carrying the hammer or hammers D, moves, and they

are held in position and the space between them covered by a headpiece E, which forms the uppermost portion of the inverted-V grate. This headpiece E also serves to limit the movement when the grids are struck. The lower edges of the grids each rest in a groove F, so as to allow of the necessary movement. These grooves are formed in the upper edge of solid division-pieces F², which prevent the air which is introduced beneath the grate from getting up between the charge and the walls of the furnace and also form water-wells H, into which the spent fuel falls and from which it can be removed through the openings I without interrupting the operation of the furnace. The hammer or hammers D is or are preferably operated by means of a lever G, secured to the spindle C, so that blows can be given to the tops of the grids on either side as desired.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a gas-producer, a grate consisting of grids arranged in inverted-V form, bearings for the lower edges of the grids, a support against which the upper edges of the grids normally rest, a spindle adapted to be operated from outside the furnace, and means such as a projection or hammer on said spindle having freedom of movement between the upper ends of the grids and adapted upon rotation of the spindle to strike the grids and move them outwardly in opposite directions.

2. In a gas-producer, a grate consisting of grids arranged in inverted-V form, bearings for the lower edges of the grids, a support against which the upper edges of the grids normally rest, a spindle adapted to be operated from outside the furnace, means such as a projection or hammer on said spindle having freedom of movement between the upper ends of the grids and adapted upon rotation of the spindle to strike the grids and move them outwardly in opposite directions, and a headpiece above the spindle covering the space between the upper ends of the grids.

3. In a gas-producer, upright partitions at the bottom of the combustion-chamber, forming an air-inlet compartment beneath the

grate and water-seal spaces at the sides of said compartment, a grate consisting of grids arranged in inverted-V form over the air-compartment, bearings for the lower edges of the grid, a support against which the upper edges of the grids normally rest, and means operating between the upper ends of the grids and common to both for moving the same outwardly in opposite directions.

10 4. In a gas-producer, upright partitions at the bottom of the combustion-chamber forming an air-inlet compartment beneath the grate and water-seal spaces at the sides of said compartment, said spaces being adapted
15 to receive the spent fuel and being provided with openings through which they are accessible from the exterior of the producer for the removal of said spent fuel, a grate consisting of grids arranged in inverted-V form
20 over the air-compartment, bearings for the lower edges of the grid, a support against which the upper edges of the grids normally rest, and means operating between the upper ends of the grid and common to both for moving
25 the same outwardly in opposite directions.

5. In a gas-producer, two upright partitions extending across the bottom of the combustion-chamber and forming an air-inlet compartment beneath the grate and water-seal
30 spaces at the sides of said compartment, a grate consisting of two grids bearing at their lower edges respectively on the upper edges

of said partitions and arranged in inverted-V form over the air-compartment, a support against which the upper edges of the grids
35 normally rest, and means operating between the upper ends of said grids and common to both for moving the same outwardly in opposite directions.

6. In a gas-producer, two upright partitions
40 extending across the bottom of the combustion-chamber and forming an air-inlet compartment beneath the grate and water-seal spaces at the sides of said compartment, a grate consisting of two grids bearing at their
45 lower edges respectively on the upper edges of said partitions and arranged in inverted-V form over the air-compartment, a support against which the upper edges of the grids normally rest, a spindle adapted to be oper-
50 ated from outside the furnace, and means such as a projection or hammer on said spindle having freedom of movement between the upper ends of the grids and adapted upon rotation of the spindle to strike the grids and
55 move them outwardly in opposite directions.

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

EDWARD JAMES DUFF.

Witnesses:

ALFRED PATCHETT,
THOMAS SPROAT.