

J. MALY.
GAS PRODUCER.
APPLICATION FILED MAR. 5, 1908.

906,812.

Patented Dec. 15, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

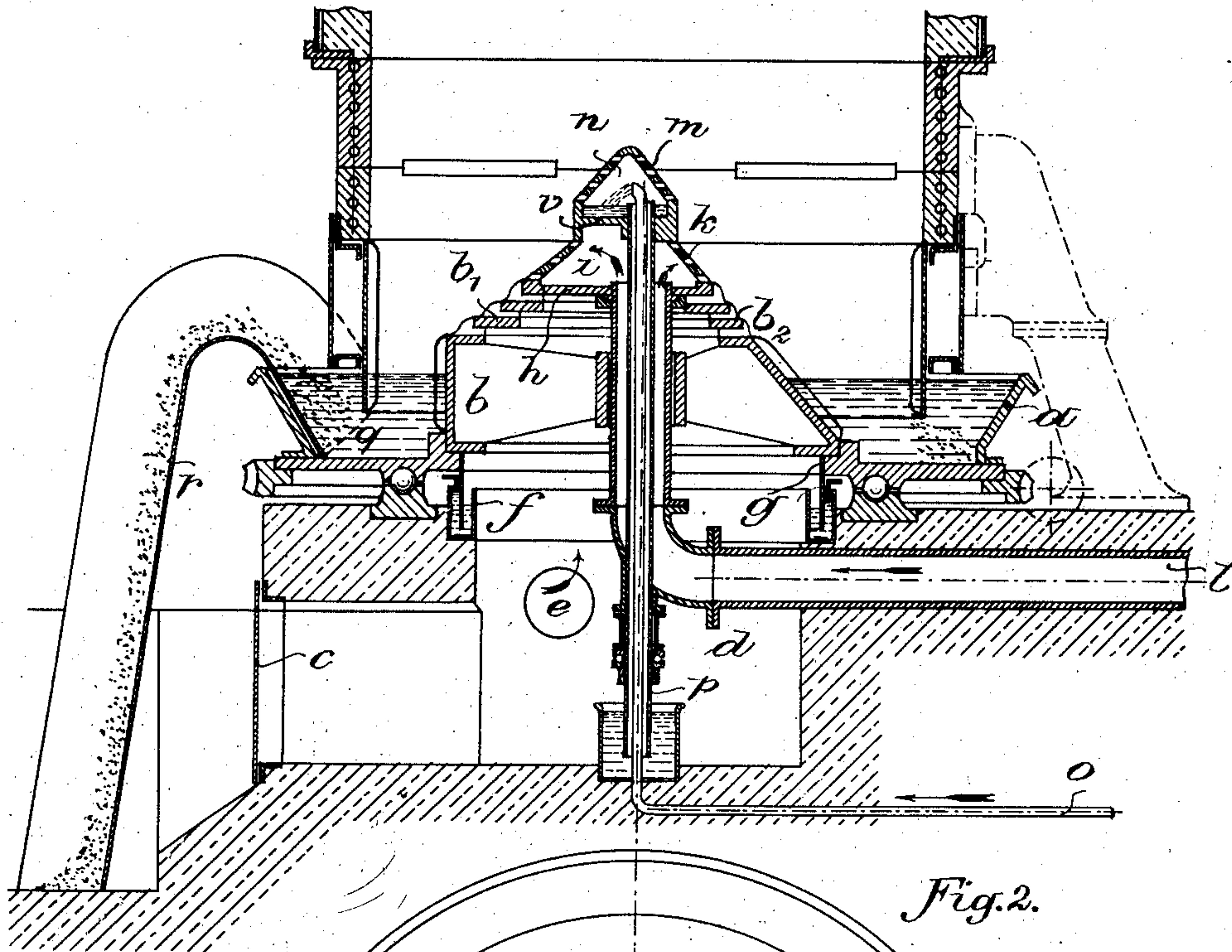
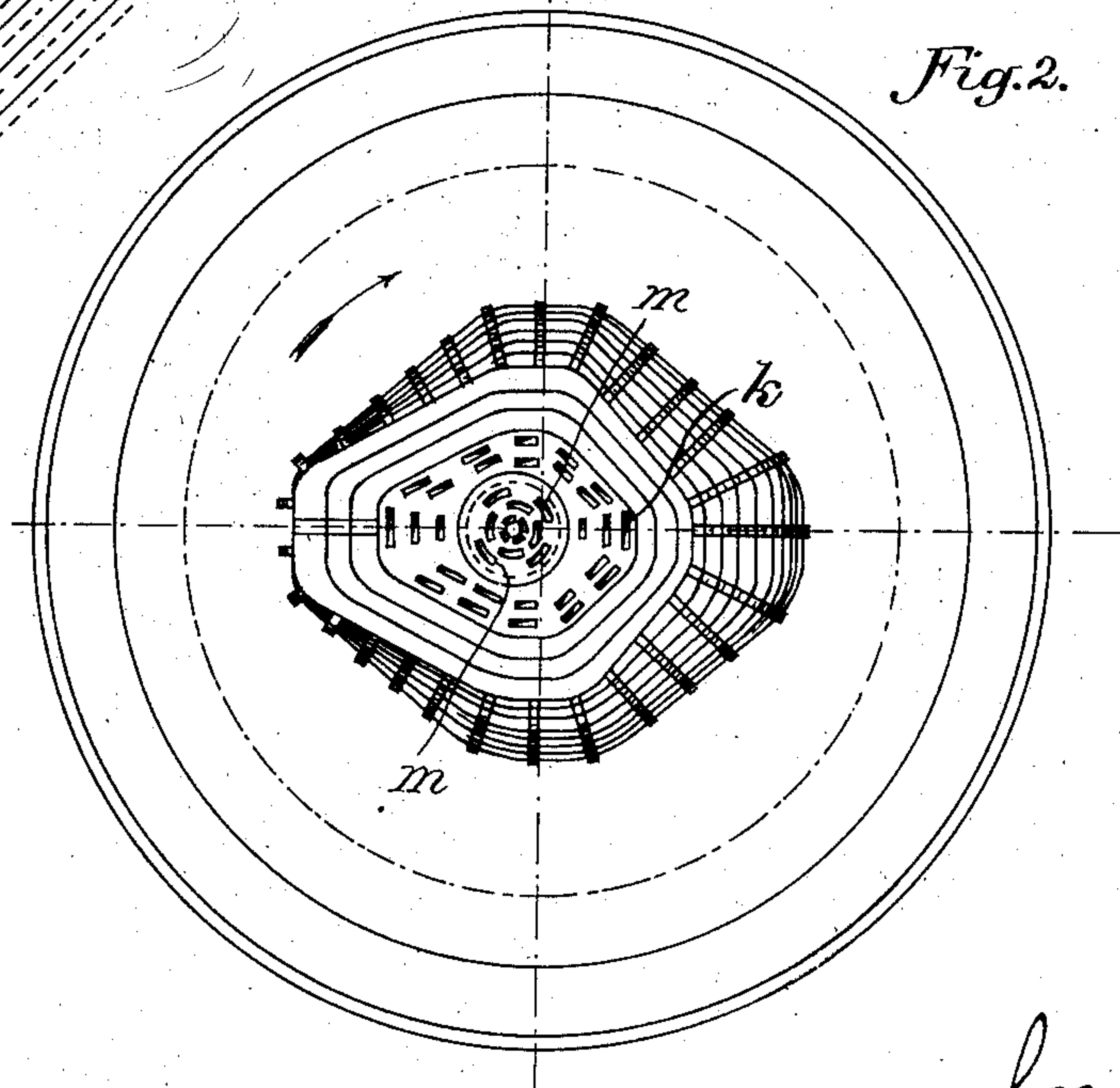


Fig. 2.



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2 SHEETS—SHEET 2.

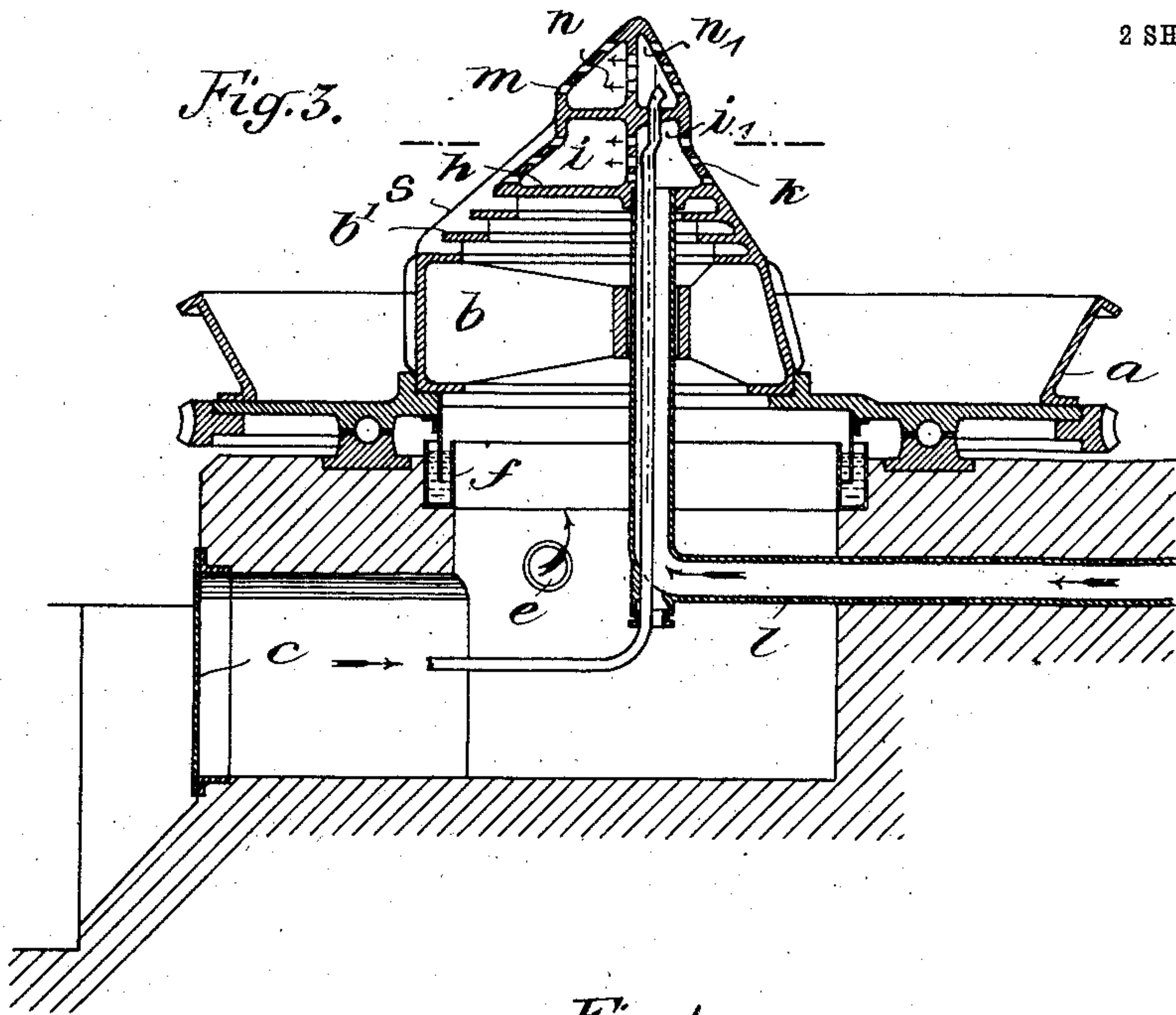
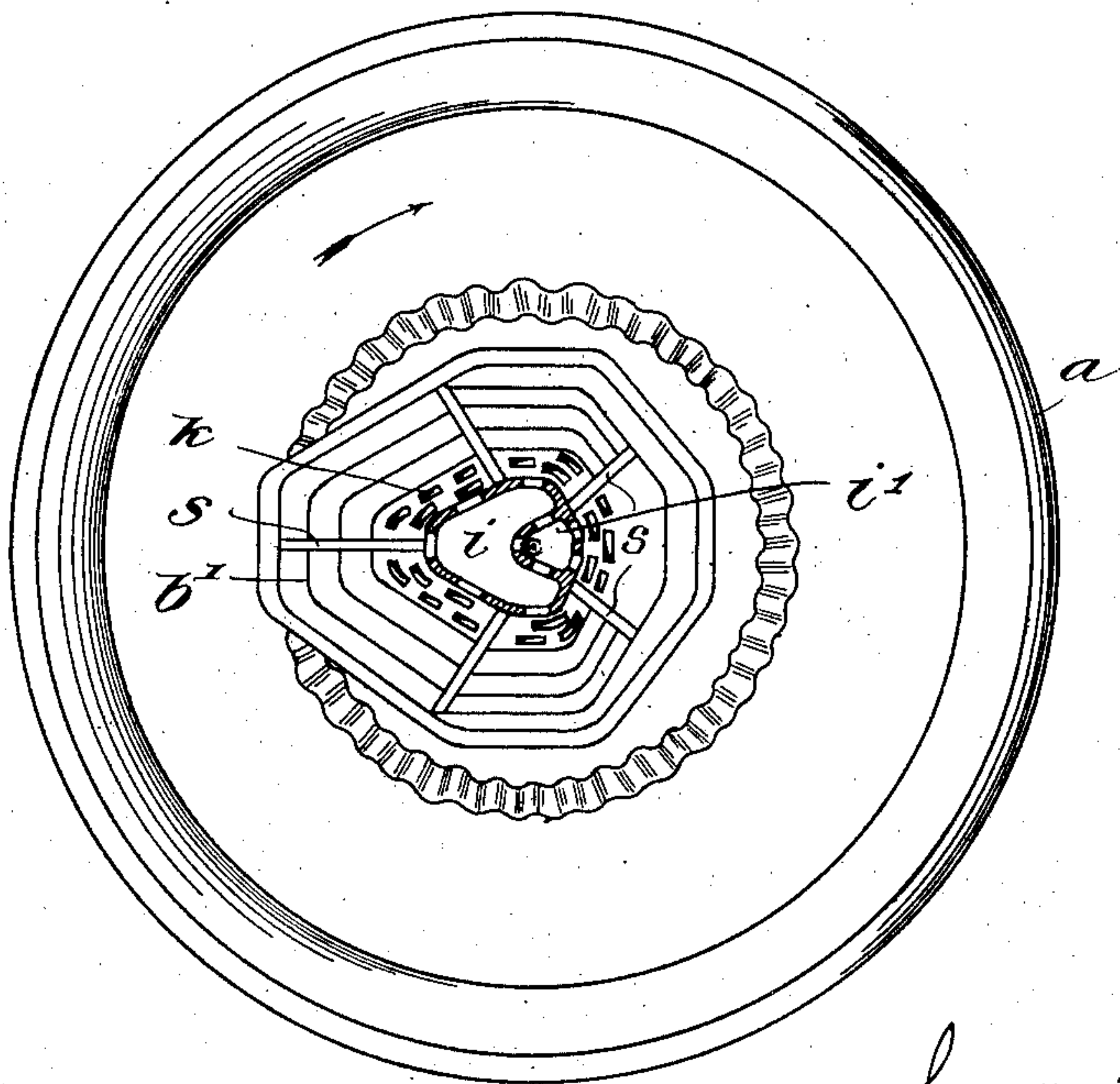


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOSEF MALY, OF DRESDEN, GERMANY.

GAS-PRODUCER.

No. 906,812.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Application filed March 5, 1908. Serial No. 419,301.

To all whom it may concern:

Be it known that I, JOSEF MALY, a subject of the Austro-Hungarian Emperor, and residing at Lüttichaustrasse 14, Dresden, A., Germany, have invented certain new and useful Improvements in Gas-Producers, of which the following is a specification.

The subject-matter of the present invention is an improvement in gas-producers and particularly in those in which the air is supplied above a rotating ash-plate which serves simultaneously as a basin for water, and the slag is removed preferably automatically at the edge of the ash-plate.

The invention consists particularly in admitting the air and steam in a special manner, as well as in a special form of construction of the grate or nozzles used for the admission of air and steam.

A principal feature of the present invention consists in the device for admitting air, and steam being divided into a plurality of compartments, whereby it is possible to introduce at definite parts of the producer air and steam at varying pressures, or only air, or more steam than air, or more air than steam.

In order that the invention may be clearly understood reference is made to the accompanying drawings in which two different embodiments are represented by way of example and in which:—

Figure 1 is a vertical section, and Fig. 2 a plan of one embodiment, whereas Fig. 3 is a vertical section, and Fig. 4 a plan of the second embodiment.

In the form represented in Figs. 1 and 2 there is built on the rotating or revoluble ash-plate *a* and eccentrically to the same a casing *b* which in plan is preferably shaped round, rhomboidal or the like and which rotates with the ash-plate. This casing communicates directly with a chamber *d* under the same accessible from without through a door *c*. Air is blown into this chamber through an opening or pipe *e*. A channel *f* forming a water-lock with a ring *g* projecting downwards from the ash-plate prevents the emission of the air below the producer.

As is seen in the drawing the upper part of the casing *b* is shaped conically corresponding to the plan of the casing and at *b*¹, *b*² like a step-grate. At the one side below *b*² the casing *b* is also shaped conically. The upper part of the cone built on the casing *b* forms a chamber *i* separated from the lower

part of the casing by a partition *h* and this chamber *i* is provided with a number of openings *k* on its periphery. To the chamber *i* there leads a special stationary blast-pipe *l* through which can be introduced blast of higher or other pressure than into the chamber *d* or the lower part of the casing *b*.

The point *m* of the cone likewise forms a special chamber separated from the chamber *i* by a partition *v* and is provided with a special conduit *o* which is particularly used for introducing steam of a definite pressure, but which however under certain circumstances can also be connected with a special air-pipe. In the form represented in Fig. 1 of the drawing, the pipe *p* could serve for introducing compressed air. In the form represented in Fig. 1 the chamber *i* is thought of as admitting air mixed with steam, or for air of variable pressure, whereas the chamber *m* is exclusively for admitting steam. From the above description it is at once clear that air, or air and steam, or only steam or only air of definite variable pressure or regulatable tension can be introduced optionally at three places or into three different zones of the producer. In the case of many kinds of fuel which lie very closely or form a compact ash, blast of high tension without any admixture of steam will be admitted. In the second zone, or through the second chamber *i* since purer fuel is situated over the same and a higher temperature is generated, blast of a different tension mixed with more steam is supplied, in order to utilize the excess heat generated for forming hydrogen, whereas the uppermost chamber *m* is used exclusively for admitting steam at high tension.

Several effects can be obtained by introducing steam at the point of the conical grate. Firstly it can be prevented that the stream of the gases generated above the grate joins together in the center and the gases are prevented from burning upwards centrally. The steam drives the stream of gases apart and also compels the air or mixture of air and steam admitted further below to distribute to the sides also and to pass through the whole of the cross-section of the producer uniformly. Further by admitting steam of definite variable tension at the point of the grate lumps of ashes which form in the center can be broken up. This division is promoted mechanically in addition by the grate being provided with high

ribs and the point or cap of the grate or cone is arranged as the drawing shows, somewhat eccentrically, and consequently it has a moving or boring action in the center of the layers of the fuel. The formation of lumps of ashes can also be prevented, an excessive rise of temperature in the center of the producer being prevented by the decomposition of the excess of steam, and the excess of heat, which is conducive to the formation of lumps of slag, is utilized for forming hydrogen by decomposing the steam. It is at once clear that in the case of such admission of steam and air variable within wide limits, it can be attained that the charge or the coal and particularly the residue of the gasification falls down in the producer uniformly. In consequence of the grate or casing *b* being arranged eccentrically the ashes or slags arriving at the lower end in the ash-plate are pressed out under the water-level when the ash-plate is rotated and rise to the scraper or deflector *g* and falls over the edge of the plate through the conduit or chute *r*.

The form represented in Figs. 3 and 4 differs from that represented in Figs. 1 and 2 substantially by the chambers *i* and *n* being divided in addition by vertical partitions into compartments *n* and *n'* and *i* and *i'*, the walls of the compartments being perforated. The chamber compartments *n'* and *i'* have independent pipes, one of these pipes conducts to *n'* and the other to *i'*.

The principal purpose of this is to admit more steam at a definite place, namely at the part of the conical grate which descends steeper than at the other parts of the periphery, in order to break up the lumps of slag more quickly and powerfully, and to utilize the heat stored up in the same for decomposing the steam. In the form represented in Fig. 3 the right-hand side of the producer would work for forming water-gas, and the left-hand side for air-gas. When the grate is rotated these two parts are gradually displaced of course. Also the arrangement of the ribs *s* represented in Figs. 3 and 4 is of great importance; these ribs on the conical face of the grate must contribute much to the uniform working of the generator or to the ashes and slags falling down simultaneously. As is at once clear, these ribs stir and move the burning layer of fuel, and above all break up the slags.

For fuels which form slacks as hard as glass and iron, the lower part of the grate and also the inner wall of the producer opposite the grate is provided with ribs in order to grind the slacks to powder when the grate rotates in the manner of a stone-breaker. Since a sandy mass is formed which in many cases binds like cement in the water-bath, knife like looseners are at-

tached at two or more places on the producer-wall which dips into the water-bath, said looseners reaching to the bottom of the dish or plate. When the plate is rotated these knives cut the layer of cement, so that the passage for the slacks or ashes below the producer which would otherwise be diminished is kept open.

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

1. The combination, in a gas-producer, of a revoluble ash-plate having a hole in the same and forming the bottom of the producer, with a grate having a round or rhomboidal or the like cross-section mounted over said hole eccentrically on said ash-plate, said grate having one or more partitions dividing the same into a plurality of chambers, and pipes opening into said chambers and affording admission thereto of air alone and steam alone, or air and steam mixed.

2. The combination, in a gas-producer, of a revoluble ash-plate having a hole in the same and forming the bottom of the producer, with a grate having a rhomboidal cross-section mounted over said hole eccentrically on said ash-plate, said grate having one or more horizontal partitions dividing the same into a plurality of superposed chambers, pipes opening into the upper chambers and affording admission of air and steam and a main blast pipe opening into the lowest chamber and operable independently of said air and steam pipe.

3. The combination, in a gas-producer, of a revoluble ash-plate having a hole in the same and forming the bottom of the producer, with a grate having a rhomboidal cross-section mounted over said hole eccentrically on said ash-plate, an annular channel for water under said ash-plate, a ring attached to the latter projecting into said channel, said grate having one or more partitions dividing the same into a plurality of superposed compartments, pipes opening into the upper compartments and affording admission of air and steam and a main blast pipe opening below said ash-plate into the lowest compartment.

4. The combination, in a gas-producer, of a revoluble ash-plate having a hole in the same and forming the bottom of the producer, with a pyramidal grate mounted over said hole in said ash-plate, said grate having a plurality of horizontal partitions dividing the same into a plurality of superposed chambers, a plurality of pipes opening into the lower chambers, and a separate pipe opening into the uppermost chamber in the point of the grate, the point of the grate being situated eccentrically to the axis of rotation of said ash-plate, said pipes affording independent admission of air and steam to the top and bottom chambers.

5. The combination, in a gas-producer, of

a revoluble ash-plate having a hole in the same and forming the bottom of the producer, with a pyramidal grate mounted over said hole on said ash-plate, said grate having a plurality of horizontal partitions dividing the same into a plurality of superposed chambers, said grate having a perforated vertical partition dividing the upper chambers into compartments, a plurality of pipes opening into the lower chambers, and a separate pipe opening into the uppermost chamber in the point of the grate, the point of the grate being situated eccentrically to

the axis of rotation of said ash-plate, said pipes affording admission of air and steam to the top chamber independently of the supply of air and steam to the lower chambers and permitting more steam to be supplied to one side of the upper chambers in said grate than to the other side.

In testimony whereof, I affix my signature in the presence of two witnesses.

JOSEF MALY.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.