No. 786,062. PATENTED MAR. 28, 1905.

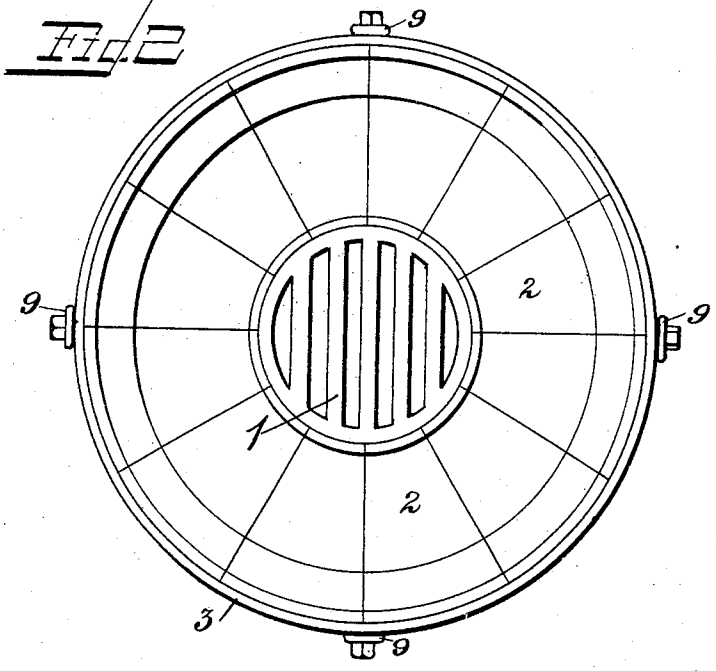
H. F. SMITH.

GRATE FOR GAS PRODUCERS.

APPLICATION FILED JUNE 16, 1904.

2 SHEETS—SHEET 1.

Fig. 2



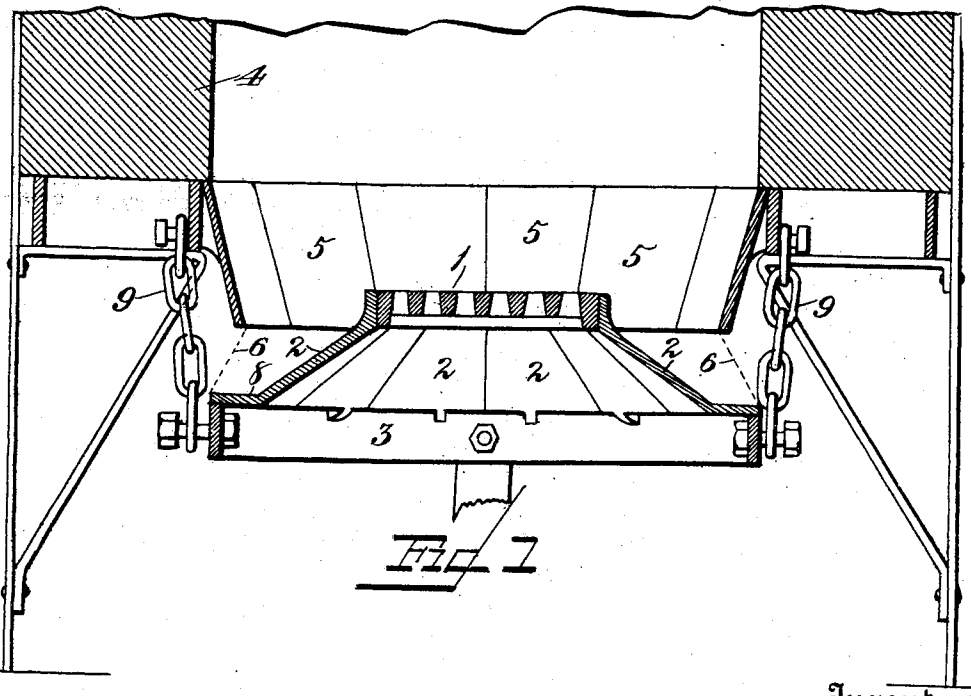


Fig. 1

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GRATE FOR GAS PRODUCERS.

APPLICATION FILED JUNE 16, 1904.

2 SHEETS—SHEET 2.

Fig. 3.

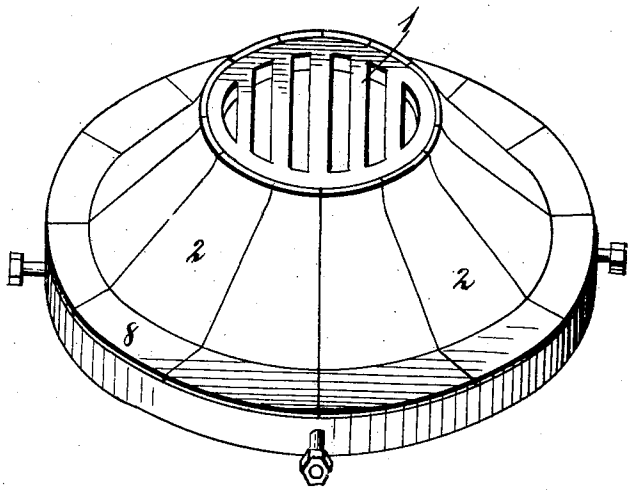
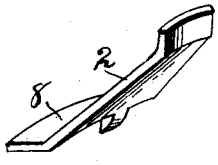


Fig. 4.



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No. 786,062. Patented March 28, 1905.

UNITED STATES PATENT OFFICE.

HARRY F. SMITH, OF LEXINGTON, OHIO.

GRATE FOR GAS-PRODUCERS.

SPECIFICATION forming part of Letters Patent No. 786,062, dated March 28, 1905.

Application filed June 16, 1904. Serial No. 212,888.

To all whom it may concern:

Be it known that I, HARRY F. SMITH, a citizen of the United States, residing at Lexington, in the county of Richland and State of Ohio, have invented new and useful Improvements in Grates for Gas-Producers, of which the following is a specification.

This invention has relation to gas-producers, and particularly to such as employ carbonaceous fuel, the clinkers and ashes of which are removable from the bottom of the producers.

The present improvements have relation more especially to the grate, having in view not only the comparatively easy removal of the clinkers, but the keeping of the unburned fuel at such a level and in such position that it may be most readily consumed and acted upon by the blast of air and steam.

My invention consists, broadly, of a grate formed as a whole in the shape of a frustum of a cone and connected at its lower edges to a ring, which in turn is supported through the medium of chains connected with the supports of the furnace, whereby the grate can be readily shaken and the clinkers removed from the edges or sides of the producer where they are most likely to become "hung up." Many other advantages will appear obvious and be described hereinafter in setting forth the construction and arrangement of parts which comprise the invention.

Of the drawings, Figure 1 is a vertical central sectional view of the lower portion of a gas-producer having my improved grate applied thereto, the latter and its immediate equipments being also shown in vertical section. Fig. 2 is a plan view of the grate and its immediate means of suspension. Fig. 3 is a perspective view of the grate detached. Fig. 4 is a perspective view of one of the sections of the grate.

In the drawings, 1 designates the central part of the grate, which is formed as a foraminous plate. The sides of the grate are composed of smooth plates 2, adapted to be fastened at their upper ends to the plate 1 and to extend downwardly and outwardly to a ring 3, to which they are properly secured. The whole comprises, as is shown, a substantial frustum of a cone in form.

4 designates the walls of the gas-producer, which is suitably supported on iron-work, though it might as well be suitable masonry or brickwork.

To the supporting means, as the invention is herein shown, the grate is hung or supported through the intervention of chains 9, connected with said supporting means and the ring 3 of the grate, the arrangement being such that the grate may swing freely to a limited extent in any direction.

5 designates the bosh-plates, which extend inward around the bottom of the producer toward the grate and at a sufficient height thereabove to allow a space for the discharge of clinkers between the lower edges of the bosh-plates and the grate when the grate is being shaken and yet sufficiently near to support the ashes on the grate when the same are at rest, substantially as indicated by the dotted line 6 6 in Fig. 1.

The central plate portion 1 of the grate supports the central portion of the fuel and admits the air freely to the center of the burning fuel.

The sloping sides of the grate permit of the rapid settling of the fuel and ashes next to the walls, where it is most inclined to hang up. This tendency of the ashes to hang up around the circumference of the fuel-bed requires that it be removed most rapidly around this line and more slowly at the center. There is also a tendency for the blast to pass up next to the walls, or lining instead of through the whole mass of the fuel, and consequently I have constructed my grate so as to resist the said tendency to as great an extent as possible without, however, so concentrating the blast at the center as to cause clinkering of the fuel or "channeling" of the fire, if the fuel should be loose at this point. The substantially solid arrangement of the grate near its outer edge tends to retard the flow of air to the fuel-bed at this point—*i. e.*, next to the wall or lining—and also accelerates the discharge of ashes when the grate is shaken by affording a smooth surface over which the ashes freely slide.

In order to assist in supporting the ashes on the edge of the grate when the grate it at

rest, its lower edge is made horizontal, as at 8. This horizontal portion is of an extent but little more than appreciable. In other words, it is quite narrow.

In shaking the grate any appropriate means, as a poker, may be used to slightly swing the grate from side to side and rotate it slightly back and forth. This causes the fuel and clinkers around the sides to slide down the bosh-plates upon the sloping sides of the grate and thence off the same, while the center of the bed in the flat portion 1 of the grate can be raked in order that it may settle with the utmost nicety.

The fact that the grate is allowed to swing to a limited extent and that its sides are sloping, as described, permits of clinkers of large size to be readily removed without great danger of dragging down too great an amount of burning fuel with them.

It is to be noted that the grate is not only capable of having a limited swinging and rotating motion imparted to it, but a tilting movement as well, the advantages of which will be understood without further description. It will also be understood that the parts may be differently arranged and supported with respect to each other without departing from the nature or spirit of the invention.

I claim—

1. A grate for gas-producers having a flat grated top, smooth imperforate sloping sides, and a horizontal ledge or rim at its bottom.

2. A grate for gas-producers having a flat grated top, imperforate sides in the form of a frustum of a cone, and a horizontal ledge or rim at the base.

3. A grate for gas-producers, having a flat grated top, imperforate sloping sides, and an imperforate horizontal base.

4. A grate for gas-producers, having a flat grated top, imperforate sloping sides and an imperforate horizontal base, in combination with the supports for the body of the gas-producer, and chains, supporting the grate from the producer.

5. A grate for gas-producers having a flat grated top, imperforate sloping sides, and a horizontal ledge or rim at the base, in combination with the lower portion of a gas-producer, having bosh-plates that slope inwardly toward the junction of the ledge with the sides of the grate.

6. The combination, in a gas-producer of the inwardly-sloping bosh-plates, and a frusto-conical grate loosely suspended at the bottom of the producer, the outer edges of the grate below the lower edges of the bosh-plates being substantially horizontal in form, and the grate being imperforate excepting on its top.

7. A grate for gas-producers, having a flat grated top, imperforate sloping sides and a horizontal ledge at its bottom, in combination with the supports for the producer proper, and means for loosely suspending the grate from the latter.

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

HARRY F. SMITH.

Witnesses:
A. B. BEVERSTOCK,
H. B. SOWERS.