E. HILGER.

ROTARY GRATE FOR GAS PRODUCERS.

APPLICATION FILED DEC. 2, 1909.

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Fig. 1

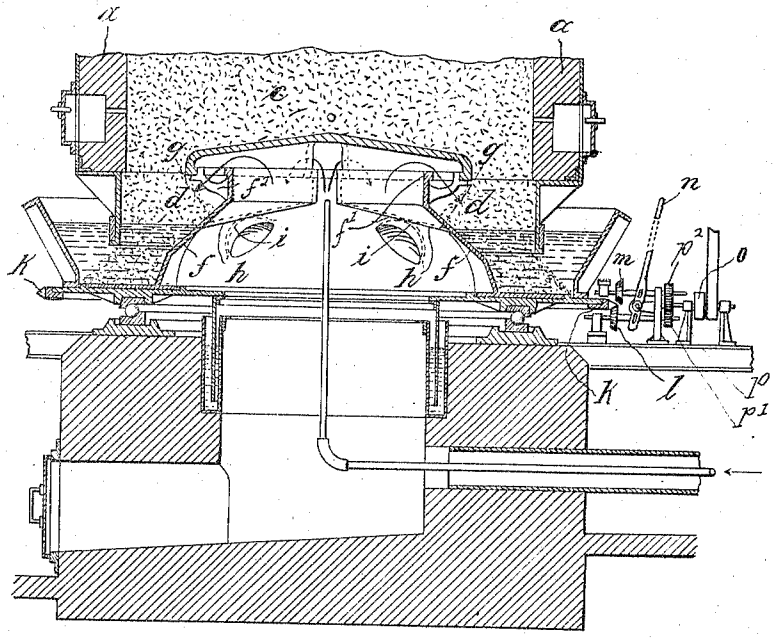
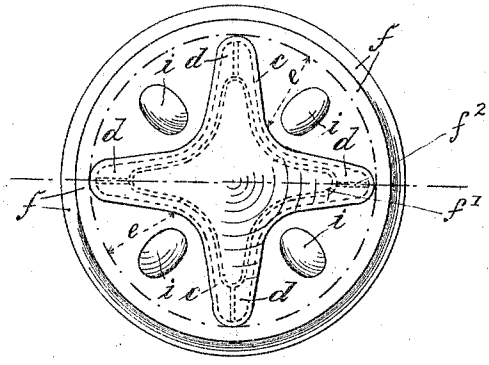



Fig. 2




Witnesses:
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# UNITED STATES PATENT OFFICE.

ERNEST HILGER, OF DUSSELDORF, GERMANY.

## ROTARY GRATE FOR GAS-PRODUCERS.

967,637. Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed December 2, 1909. Serial No. 530,902.

*To all whom it may concern:*

Be it known that I, ERNEST HILGER, a citizen of the German Empire, and a resident of Dusseldorf, Germany, have invented a new and Improved Rotary Grate for Gas-Producers, of which the following is a specification.

This invention relates to rotary grates for gas producers and comprises more essentially a stellated hood crowning a similarly shaped base in such a manner that a downwardly opening zig-zag air inlet is formed between said hood and base.

The accompanying drawings illustrate a grate constructed in accordance with this invention; wherein—

Figure 1 shows in vertical central section the lower part of the producer together with the grate, and Fig. 2 shows a top plan view of the furnace plate.

The gas producer *a* is provided at its bottom with a rotary grate which comprises essentially a coniform base *f* having a stellated head *f'*. The latter is overlapped by a stellated slightly tapering spaced hood or plate *c* supported upon suitable brackets $f^2$ in such a manner that a star-like downwardly opening continuous passage is formed through which the air escapes in the direction of the arrows *d* (Fig. 1). Owing to the peculiar shape of the air passage, an annular space *e* is swept by the air when the grate is rotated. The plate *c* projects considerably beyond the portion of the grate *f* immediately below it, thus entirely preventing the entry of the producer charge into the internal air-space of the grate, a defect common to all the various constructions heretofore made. The somewhat considerable loss of fuel and the inequality in the air-supply, which have resulted in the unsatisfactory working which has heretofore resulted from the choking of the air-space are consequently both eliminated in apparatus according to this invention.

In such apparatus the charge falls loosely to the line *g—h* while the air can enter freely at *d* into the loosely-disposed mass. This invention moreover prevents fuel from burning up too rapidly to a great height at the center of the producer, and the too rapid gasification of the fuel at the edge of the grate, as well as the burning away of this edge. The supply of air is thus considerably facilitated while the slag can moreover be much more easily removed than in other constructions especially as the grate does not rotate continuously in the same direction in relation to the casing, but is moved forward through a certain determinate angle and then again backward through a fraction of this angle. This kind of movement considerably facilitates the descent of the loose slag and also facilitates the action of the projections of the furnace plate upon the compact accumulations of slag, as, when the grate moves backward the loose slag is laid bare and caused to fall into the ashpit, while the compact slag which adheres to the side of the casing, has to bear the weight of the charge lying over it and is consequently exposed to considerable pressure. When now the grate moves forward, it, or more correctly speaking, its points or projections will first move through a space or clearance produced through the descent of the loose slag and will then come in contact with the compact slag with the result that the slag, which at the same time has to support the weight of the charge of fuel lying over it, is broken up, and especially during the last rearward movement of the grate, is detached by the points of the plate.

The peculiar movement of the grate just described results therefore first in the formation of a hollow space through the descent of the loose slag and secondly in an attack on the compact slag on the sides of the casing from the one side during the rearward movement of the grate and still more energetically on the same portion of slag from the other side during the subsequent forward movement of the grate. The movement of the grate and casing relatively to each other may in some cases be effected in such manner that the grate and casing both move in opposite directions.

The peculiar movement of the grate already described may be effected by any suitable means. In Fig. 1 the grate is shown surrounded by a ring *k* which is provided with bevel teeth on its upper and on its lower edge, with which teeth there mesh respectively the bevel wheels *m* and *l;* these wheels being alternately brought into engagement with the ring *k* by means of the lever *n* and being actuated through spur gear *p*, *p'*, $p^2$, from fast and loose pulleys *o*. In the example of apparatus shown in Fig. 1 of the drawings the reversal of the bevel teeth together with the forward and rearward movement of the rotary grate is shown as ef-

fected by the manual operation of the lever *n*. This however is done only for the purpose of rendering clear the operation of the apparatus. In practice it will of course be more advantageous in almost all cases to effect the reversal by automatic means in such manner that after the grate has been moved forward through a certain determinate angle in one direction it is moved backward to a lesser extent in the opposite direction.

What I claim is:—

1. In a device of the character described, a rotary grate comprising a hollow base having a stellated head, and a spaced stellated hood that overlaps said head to form a star-like downwardly opening continuous air passage.

2. In a device of the character described, a grate comprising a hollow coniform base having a stellated head, a spaced stellated hood that overlaps said head to form a star-like downwardly opening continuous air passage, and means for rotating the grate, whereby a uniform air supply is effected and the entrance of the charge into the air passage prevented.

3. In a device of the character described, a rotary grate comprising a hollow coniform base having a stellated head, and a spaced stellated slightly tapering hood that overlaps said head to form a star-like downwardly opening continuous air passage.

4. In a device of the character described, a rotary grate comprising a hollow coniform base having a stellated head, brackets on said head, and a stellated hood supported on said brackets and overlapping the head to form a star-like downwardly opening continuous air passage.

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

ERNEST HILGER. [L. S.]

Witnesses:

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