E. HILGER.

APPARATUS FOR AND METHOD OF OPERATING GAS GENERATOR GRATES.

APPLICATION FILED MAY 12, 1910.

981,651. Patented Jan. 17, 1911.

Fig. 1.

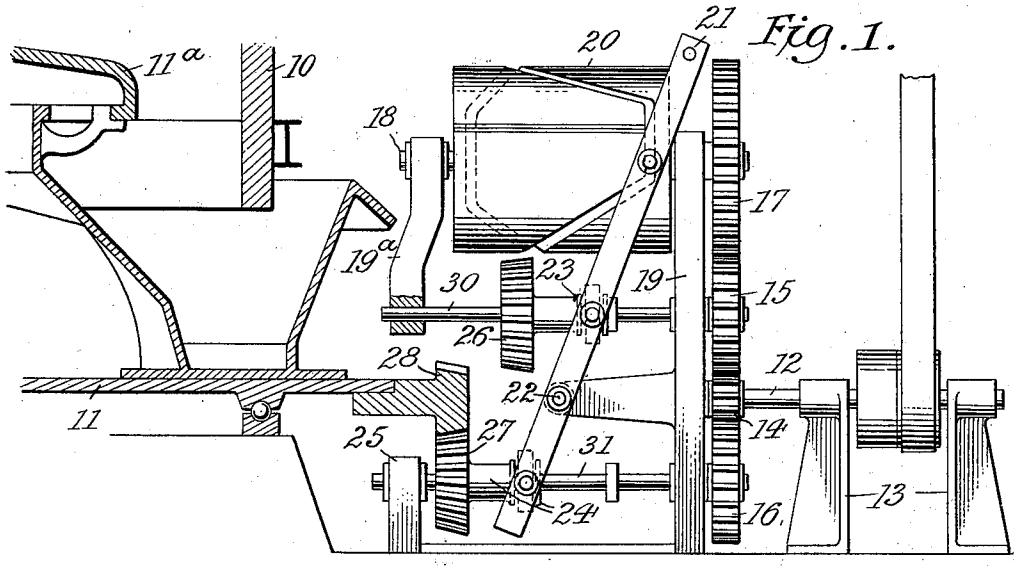
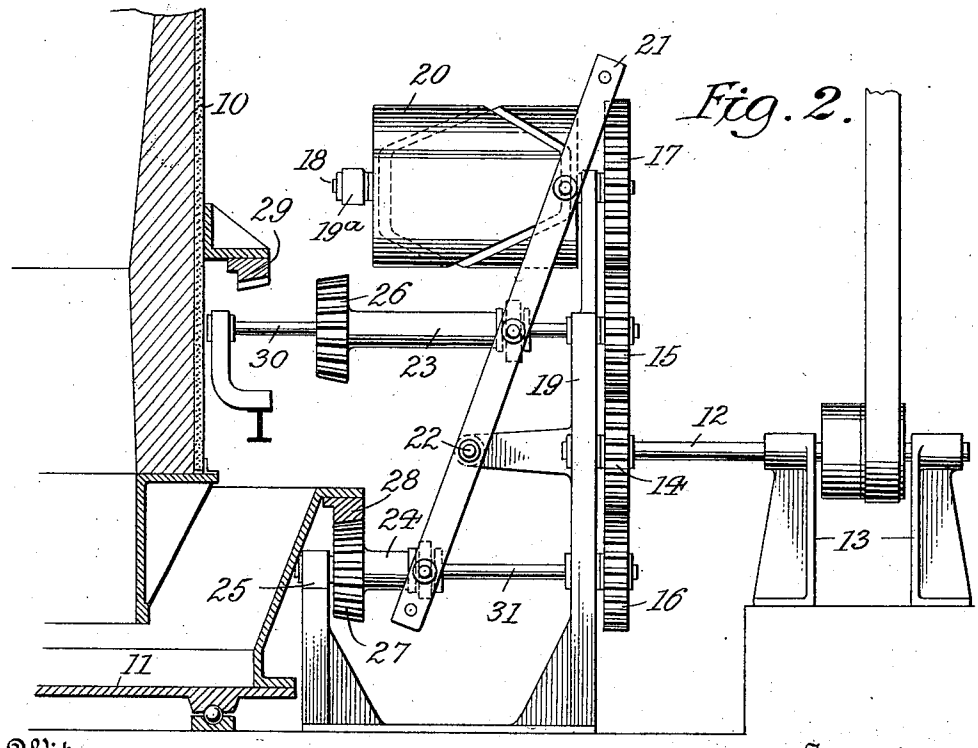


Fig. 2.



Witnesses:
Katherine Koch
Daniel Holmgren

Inventor
Ernest Hilger
By his Attorneys Briesen & Gumpert
per Arthur E. Gumpert

UNITED STATES PATENT OFFICE.

ERNEST HILGER, OF DUSSELDORF, GERMANY.

APPARATUS FOR AND METHOD OF OPERATING GAS-GENERATOR GRATES.

981,651. Specification of Letters Patent. **Patented Jan. 17, 1911.**

Application filed May 12, 1910. Serial No. 560,819.

To all whom it may concern:

Be it known that I, ERNEST HILGER, a citizen of Germany, residing at Dusseldorf, Germany, have invented new and useful Improvements in Apparatus for and Method of Operating Gas-Generator Grates, of which the following is a specification.

This invention relates to improved means for imparting to a gas generator grate of the kind described in my co-pending patent application—Serial Number 530,902, filed December 2, 1909, an intermittent rotary movement. This movement which is known as a "Pilgrim step" consists in intermittently turning the grate or the mantle or both the grate and the mantle first a certain distance forward and then a less distance backward.

In the accompanying drawing: Figure 1 is a longitudinal section of a gas generator for carrying my invention into effect, and Fig. 2 a side view of the means for moving the mantle.

The reference numeral 10 indicates the mantle of the generator, while 11 is the base of a rotatable grate 11^a having a stellated or other unround form. The driving shaft 12 for the grate is hung in bearings 13 and carries a gear wheel 14 which meshes into wheels 15, 16, wheel 15 in turn, meshing into wheel 17. The shaft 18 of wheel 17 turns in bearings 19, 19^a and carries a cam 20 engaged by a shipping lever 21 turning on fulcrum 22. Lever 21 is, by slots and pins, operatively connected to the hubs 23, 24 of a pair of bevel gear wheels 26, 27 slidably mounted upon shafts 30, 31 but prevented from rotation thereon by feather and groove connections. To the outer ends of shafts 30, 31 are keyed wheels 15, 16, the shafts being supported in bearings 19, 19^a and 19, 25 respectively. Wheels 27, 26 are adapted to alternately engage the lower and upper toothed rims of a ring 28 secured to base 11.

It will be seen that cam 20 will, by shipping lever 21, alternately reciprocate wheels 26, 27, to effect the desired alternate engagement thereof with rim 28, and thus cause the grate to be alternately advanced and retracted. The shape of the cam is such, that wheel 26 remains in engagement with ring 28 for a longer period of time than wheel 27, so that in this way the advance movement of the grate will be somewhat greater than the return movement during each step. A modified form by which the back movement of the grate is avoided, is shown in Fig. 2, where wheel 26 engages a toothed ring 29 of mantle 10.

By the above described device, the loose slag is liberated during the back movement of the grate and falls into the ash pit, the tight slag bearing meanwhile the weight of the charge. During the advance movement of the grate, its points or projections will first pass through the hollow space produced by the descent of the loose slag and will then strike against the tight slag which has been loosened somewhat by the weight of the charge. This tight slag is thus crushed, more particularly so as it is also attacked at the back by the return movement of the succeeding grate point. Thus, the effect of the operation is the production of hollow spaces by the descent of the loose slag, an attack on the tight slag deposits first from one side by a grate point and then a subsequent energetic attack on the same slag deposit from the other side by the succeeding grate point. This attack on the slag deposit by the grate, from the right and left, together with the incumbent weight of the fuel, will cause a uniform release of the slag deposit and a consequent uniform operation of the generator.

It is evident that the relative movement between grate and mantle can be such that the grate moves step by step in one direction only, while the mantle moves step by step in the other direction. In this case also the movements should be so timed as to correspond to the movements hereinabove described. However, in most cases it will be advisable to use a stationary mantle in combination with a reciprocative grate.

I claim:

1. Method of operating a gas generator having a mantle and a rotatable grate, which consists in producing a reciprocative step-like movement relatively to said mantle and grate.

2. Method of operating a gas generator

having a mantle and grate, which consists in producing a reciprocative step-like movement relatively to said mantle and grate, the forward movement during each step being in excess of the return movement.

3. In a generator, a mantle and a grate, combined with means for imparting a reciprocative step-like movement to the grate, the forward movement during each step being in excess of the return movement.

Signed at Barmen, Germany, this 13th day of April, 1910.

ERNEST HILGER.

Witnesses:
OTTO KÖNIG,
WALTER VONNEGUT.