W. E. McKAY & H. N. CHENEY.

WATER GAS GENERATOR.

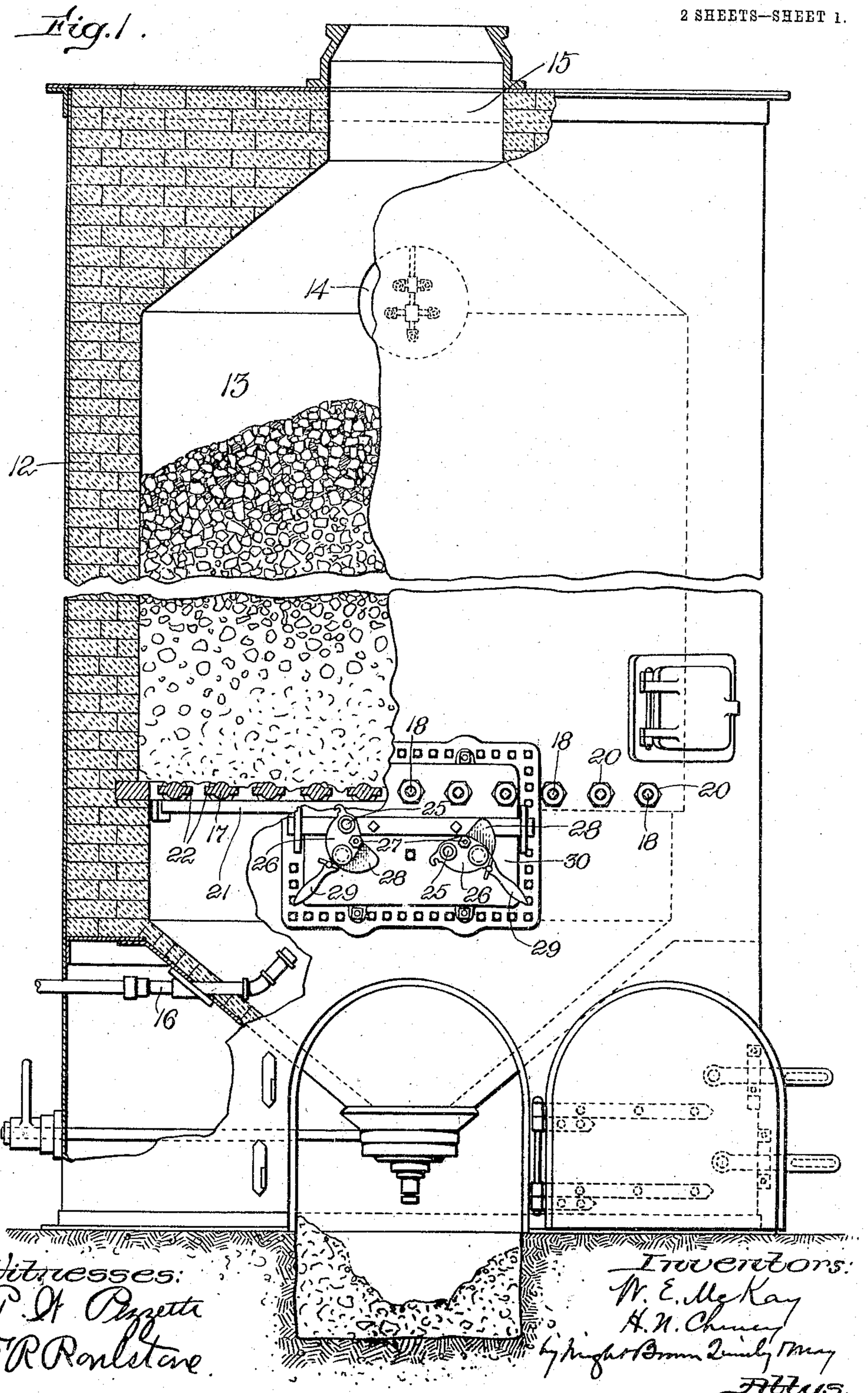
APPLICATION FILED NOV. 11, 1908.

911,899.

Patented Feb. 9, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



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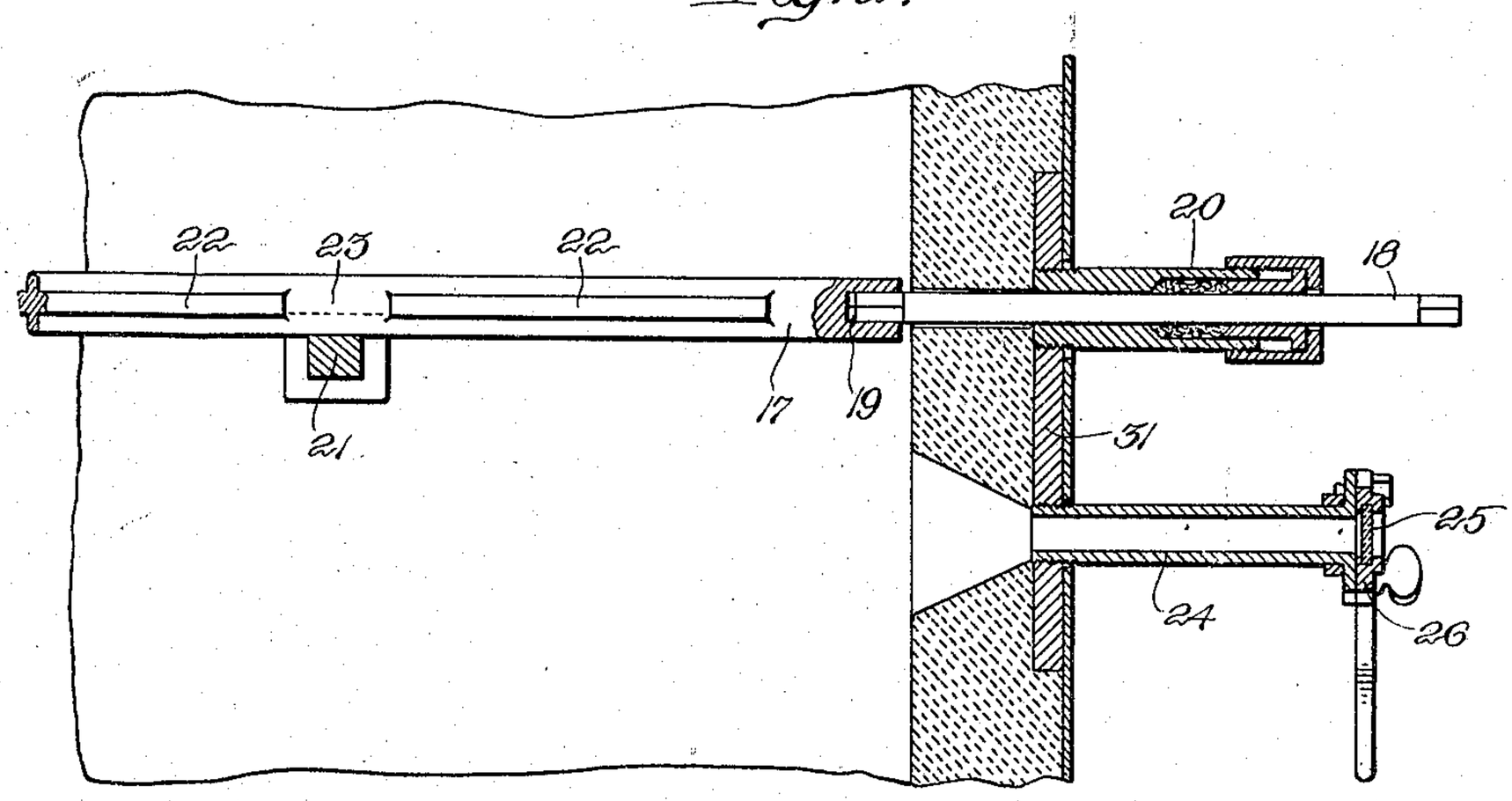
2 SHEETS—SHEET 2.

Fig. 2.



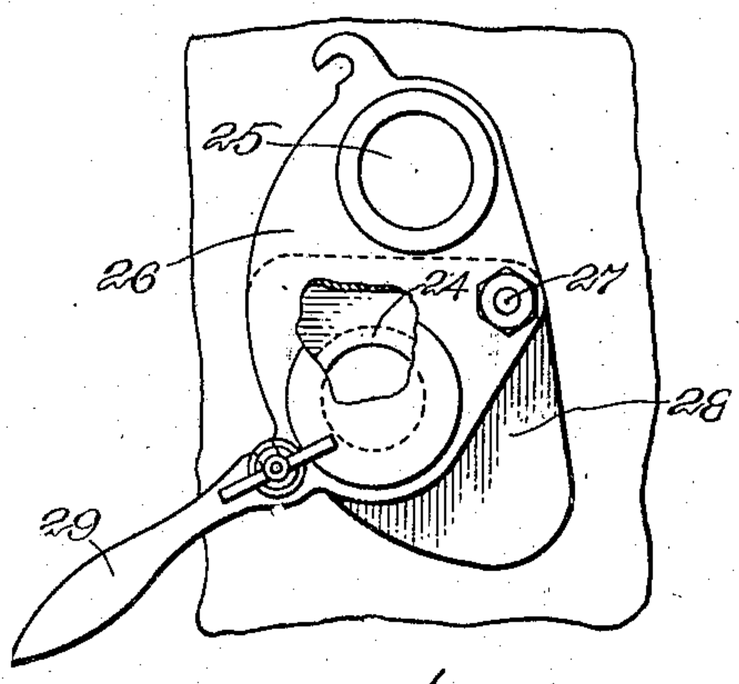


Fig. 4.

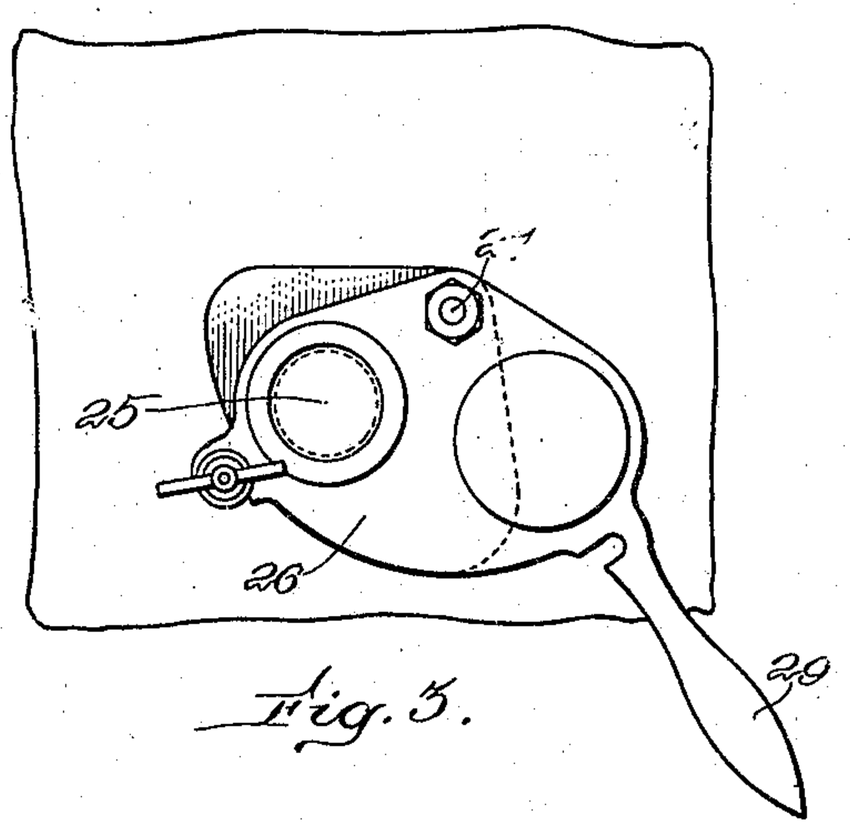


Fig. 5.

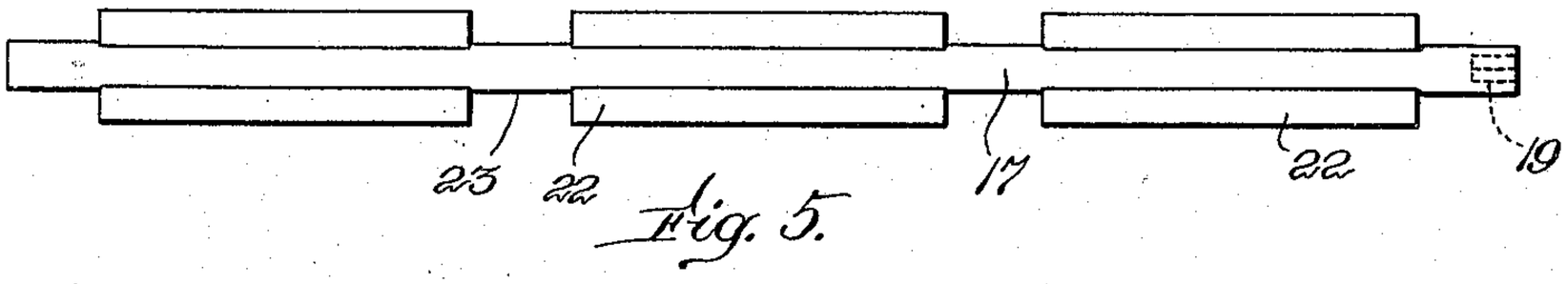


Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM E. McKAY, OF MILTON, AND HERBERT N. CHENEY, OF BOSTON, MASSACHUSETTS.

WATER-GAS GENERATOR.

No. 911,899. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed November 11, 1903. Serial No. 482,127.

To all whom it may concern:

Be it known that we, WILLIAM E. McKAY, of Milton, in the county of Norfolk and State of Massachusetts, and HERBERT N. CHENEY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Water-Gas Generators, of which the following is a specification.

This invention has for its object to provide a water gas generator adapted to continuously carry on the recurrent process of generating water gas by the combination of the component elements of steam with incandescent coal or similar fuel.

The invention is embodied in a water gas generator, which, while of ordinary construction, so far as the means for combining the said elements with the fuel are concerned, has certain novel features relating to the practical continuity of the process, said novel features including not only a grate having movable bars which are operable from the exterior of the generator without interrupting the ordinary recurrent process, so that the base portion of the bed of fuel may be cleaned by suitably moving the grate bars, but also gas-tight sight openings located below the grate and arranged in such relation to the grate bar operating means as to permit the gas maker to ascertain the condition of the base portion of the fuel bed while the same is being cleaned, the gas maker being therefore guided so that he is enabled to determine when the fire has been cleaned to the proper extent, and to avoid such an excessive cleaning of the fire as would involve waste of fuel and injurious or destructive heating of the grate bars.

The invention consists in the improvements which we will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification,—Figure 1 represents a partial side elevation and a partial vertical section of a water gas generator embodying our invention. Fig. 2 represents a fragmentary vertical section showing a construction differing in minor details from that shown in Fig. 1. Fig. 3 represents a fragmentary elevation of a portion of the exterior of the generator, and an end elevation of a gas-tight sight opening. Fig. 4 represents a view similar to Fig. 3 showing a different adjustment of the gas-tight device of the sight opening. Fig. 5 represents a plan view of one of the grate bars.

The same reference characters indicate the same parts in all the figures.

In the drawings, 12 represents a water gas generator having a fuel chamber 13, the bottom of which is formed by a grate, the chamber being provided with a gas outlet and steam inlet 14, and a fuel inlet 15.

16 represents a steam conduit entering the lower or ash-pit portion of the generator below the grate. Air under pressure is supplied through an opening (not shown) below the grate, and there is also a gas outlet (not shown) below the grate.

The general construction of the generator, excepting as hereinafter described, is old and constitutes no part of the present invention.

In carrying out our invention, we provide the generator with a grate composed of a plurality of movable bars 17, which are adapted to be operated to shake down ashes and clinkers from the base portion of the bed of fuel supported by the grate, means being provided whereby an attendant is enabled to move the grate bars to clean the base portion of the bed, said operating means having provisions for preventing the escape of air or gas from the generator.

In the embodiment of our invention here shown, each grate bar 17 is provided with an individual operating member, here shown as a shank 18 having a squared inner end engaged with a socket 19 in one end of the grate bar, and a squared outer end adapted to be engaged by a crank or handle, the said operating member passing through a stuffing box 20 affixed to the wall of the generator, and adapted to prevent the escape of air or gas around the operating member. Each grate bar preferably includes a cylindrical body portion which rests, and is adapted to turn on fixed supporting bars 21, and wings 22 projecting from opposite sides of said body, and separated by spaces 23 which coincide with the supporting bars 21 so that the grate bars may be rocked on the supporting bars 21 without interference between the wings 22 and the said supporting bars. This construction permits each grate bar to be independently operated, so that each bar may be manipulated to any extent required by the condition of the fuel bed immediately above it.

It is highly desirable, and in fact, essential

that the grate bars be operated in such manner that the base of the fuel bed will be cleaned neither too much nor too little; an excessive cleaning of the base of the bed resulting in waste of fuel and a destructive heating of the grate bars, while an inadequate cleaning impairs the efficiency of the operation. To enable the exact condition of the base portion of the bed to be ascertained by the gas maker, we provide sight openings extending through the wall of the generator below the grate, and in such position that the gas maker is enabled, while the grate bars are being manipulated, to conveniently inspect the portion of the ash-pit immediately below the grate, and ascertain by the condition of the matter escaping between the grate bars when the portion of the bed above each grate bar has been suitably cleaned, the said sight openings having means for preventing escape of air or gas from the interior of the generator.

As here shown, each sight opening includes a tube 24 inserted in an opening formed in the wall of the generator below the grate, and a light of glass or other transparent material 25 which is adapted to fit the outer end of the tube and prevent the passage of air or gas therethrough. The transparent light 25 is preferably mounted in a holder 26, which is pivoted at 27 to a flange or head 28 formed on the tube 24, the holder 26 being provided with a handle 29, and so formed that it may be swung to the position shown in Figs. 2, 3 and 4 to bring the light 25 into register with the tube when the sight opening is in use, and to the position shown in Fig. 4, to move the light 25 out of register with the tube and protect it from heat when the sight opening is not in use, a solid portion of the holder covering the sight opening when the holder is in the position shown in Fig. 4.

Any suitable number of sight openings may be employed, two being here shown, and these being shown as supported by a plate or cover 30 which is detachably secured to the wall of the generator and covers an opening extending through said wall, said opening being partly above and partly below the grate. In this case, the cover 30 carries the stuffing boxes 20 and operating members 18 of several of the grate bars. The sight openings are located so that the gas maker, while the grate bars are being manipulated, may conveniently inspect the interior of the generator below the grate.

In Fig. 2, we show a construction in which the sight openings and the grate bar operating members and their stuffing boxes are secured to a plate 31 which is itself secured to the wall of the generator.

We do not limit the construction of the grate bars or sight openings to the forms here represented: grate bars and sight openings of many different forms can be constructed to fulfill the purpose described in the manner described.

We believe ourselves to be the first to employ conjointly in a water gas generator a grate composed of movable bars which are operable from the exterior of the generator without permitting escape of air or gas therefrom, and one or more gas tight sight openings located below the grate and in such relation to the grate operating means as to enable the operator to conveniently inspect the portion of the generator immediately below the grate. These simple provisions make it entirely feasible and practicable to continuously carry on the recurrent process of generating water gas,—a result which, so far as we are aware, has not before been successfully accomplished.

We claim:

A water gas generator having a grate composed of movable bars provided with operating means extending through the wall of the generator for moving said bars, whereby the bed of fuel supported by the grate may be cleaned and the recurrent generating process continuously practiced, the said operating means having provisions for preventing the escape of air or gas from the generator, the generator also having gas-tight sight openings below the grate, whereby the condition of the base portion of the bed may be ascertained, to guide the gas maker in the operation of the grate.

In testimony whereof we have affixed our signatures, in presence of two witnesses.

WILLIAM E. McKAY.
HERBERT N. CHENEY.

Witnesses:
DAVID S. REYNOLDS,
FREDERIC S. ATWOOD.