

## PATENT SPECIFICATION

361,174

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(Patent of Addition to No. 323,147, dated Feb. 8, 1929.)

Complete Accepted : Nov. 19, 1931.

## COMPLETE SPECIFICATION.

## Improvements relating to Portable Gas-producers.



I, JEAN GOHIN, a French citizen, of 35, Avenue de Paris, Choisy-le-Roi (Seine), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to portable gas producers and consists of an improvement in or modification of the invention set forth in the specification to my Patent No. 323,147 wherein there is described a portable gas producer having cooled nozzles, the specification setting forth certain points of detail such as the regulation of the composition of the gas and the separation of the combustible and cinders, also the utilisation of the circulation of cooling water of the engine to assure the cooling of the nozzle.

It has been found that at a certain speed of the blast in the nozzle, the greatest part of the cinders enter into fusion and produce under the nozzle a cake of slag which, after a time, variable with the size of the pieces of combustible, the percentage of the cinders, the speed of the blast and the consumption of the combustible, causes a partial obstruction of the nozzle. If the speed of the blast is very notably increased, the slags can be evacuated in a liquid state which greatly prolongs the operation of the generator.

The present invention is characterised by the provision in a gas producer as above referred to, of a poker universally mounted in the wall of the producer, in such manner as to permit the poker to be displaced in the direction of its length, relative to the wall, to pierce and break any slag, clinkers or other matter deposited at the nozzle. A safety arrangement is also incorporated for stopping or restricting the blast when the combustible reaches a predetermined level, together with means for evacuating the slag and the unburnt portions of the combustible without stopping the production of gas.

Gas producers have been proposed having a poker mounted in the top cover of the producer, which poker extends into the

upper part of the fuel and is movable with a combined rotary and oscillatory movement to break up any particular part of the upper layer of fuel, but the present invention is distinguished from such arrangements in that the poker is mounted in the side wall of the producer and can also be displaced in the direction of its length for the purposes described.

The invention will be further described with reference to embodiments of construction shown in the accompanying drawing in which:—

Fig. 1 is a view in elevation of a gas producer constructed according to the invention.

Fig. 2 is an elevation of a modified arrangement, and

Figs. 3 and 4 are details of the apparatus hereafter more particularly described.

Referring more particularly to Fig. 1, the poker 11 is mounted in the stuffing box 12, which latter is preferably of spherical formation to permit of a universal movement of the poker for displacing the slag block indicated by the reference numeral 14 from the nose of the nozzle 22. The universal mounting of the poker 11 permits a sweeping movement of the poker in the form of a cone indicated in dotted lines by the numeral 13, which movement permits the poker to be moved around the nozzle 22 to displace any slag adhering thereto. The mounting of the poker in the stuffing box 12 is such as to be displaced longitudinally thereof to pierce and break the slag, clinkers or the like sticking together at the nose of the nozzle. The mounting for the poker can be positioned in any suitable part of the wall of the producer although the preferable arrangement is to position the poker directly opposite the nozzle which it is desired to keep free from slag and during the working of the apparatus the poker can be withdrawn towards the exterior more or less totally and slidden into contact with any such clinker when desired. Alternatively, the poker may be replaced by a movable arm 27 which is constructed

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integral with a shaft 29 controlled by a crank 33 (Fig. 3) which may be water-cooled as hereafter described.

In the majority of gas producers a heavy or deep layer of combustible is necessary to produce the gas; in the particular case of the present specification, gas is produced so long as the layer of combustible has not descended to the level of the nozzle. At this moment, the gas becomes rich in CO<sup>2</sup> and very hot and there is danger of damaging the generator. To avoid this, there is provided a metal float 20 which rests upon the surface of the fuel and which by the intermediary of a metallic cable 21 controls the closing of the blast in the nozzle 22 as soon as the combustible has descended to a predetermined level. An additional characteristic of the invention is to permit of the extraction of the slag block 14 without stopping the production of gas. At 27 and 28 is indicated an arm which is formed double; this arm is fixed on a shaft 29 which traverses a stuffing box 30 and is supported by a bearing 31 which may be withdrawn to permit the removal of the whole. The arm and shaft are hollow and in connection with a radiator 32 and may be filled with water to prevent the fusion of the arms 27 and 28 and the heating of the shaft 29, which heating would endanger its solidity. The radiator 32 carries a crank or handle 33 which serves to control the rotation of the shaft 29.

A door 15 is provided at the base of the producer, which door can be opened to permit the slag to fall into a chamber 17, after which the door 15 is closed and a door 16 having a grid 25 integral therewith, is opened, which permits evacuation of the slag without the interior of the producer communicating with the atmosphere. In Fig. 2 an alternative arrangement is shown for the same purpose. In a fixed installation where the gas producer is under pressure, a hydraulic joint can also be employed. The slag may be caused to descend on to the grid 25 to the underside of which a current of cool air is supplied by the tube 26 (Fig. 2) to burn the combustible which has descended on to the said grid, thus retarding the time when it is necessary to empty the said chamber 17. The grid 25 may be pivotally mounted, or as shown in Fig. 1, may be constructed integral with the door 16.

A suitable charging hopper with double closing of a known type may be employed to permit of recharging the producer without causing the pressure to fall.

If it is desired to extract the molten slag, an arrangement indicated in Fig. 4 may be employed, according to which the gases and the slag leave by the tube 23

which is surrounded by a water jacket and are separated either in a hydraulic separator 24 or in a cyclone separator. In the separator 24 the gases escape by a tube 34 and the pulverulent slags in suspension in the water leave by the tube 35.

Without departing from the scope of the invention, the slags may also be extracted by an arrangement similar to that which is employed in an ash melting gas producer.

It may also be advantageous to add to the combustible a solvent which renders the slags more fluid.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An improvement in or modification of a gas producer according to the specification of my Patent No. 323,147, characterised by the provision in such a gas producer of a poker universally mounted in the wall of the producer in such manner as to permit the poker to be displaced in the direction of its length relative to the wall and to permit poking in all directions during operation of the producer.

2. A gas producer according to claim 1, having a safety arrangement consisting of a float resting on the surface of the fuel for stopping the blast when the combustible reaches a predetermined level.

3. A gas producer according to claim 1 or 2, characterised by means for evacuating the slag and unburnt portions of the combustible without stopping the production of the gas, said means including a sieve positioned above a container having a door at the base thereof in combination with a grid positioned in said container, and means for admitting air to burn the combustible mixed with the slag, substantially as described.

4. A gas producer according to the preceding claims, having means to extract melted slags from the producer, which means includes a tube surrounded by a water jacket and a separator by means of which the gases are separated from the pulverulent slags in suspension in water, substantially as described with reference to Fig. 4.

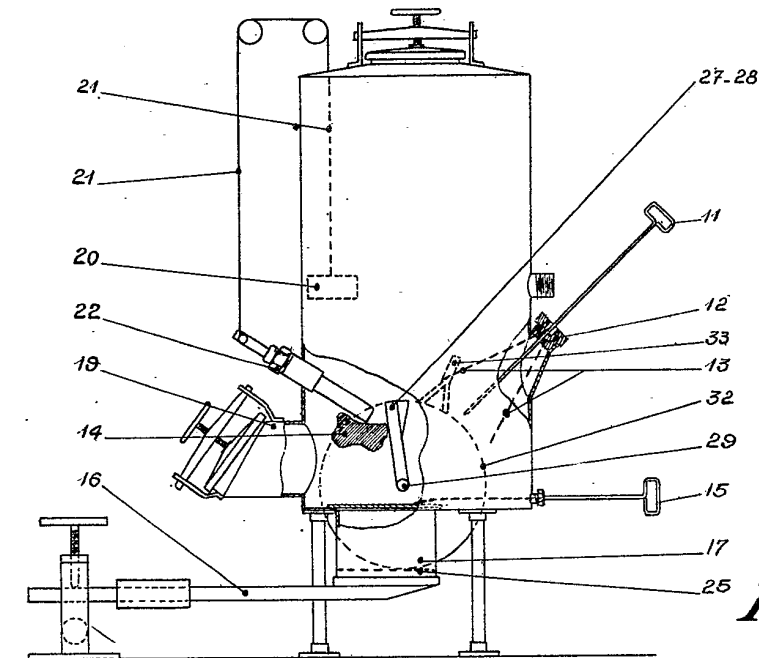
5. A gas producer constructed and arranged to operate substantially as and for the purposes described with reference to the accompanying drawings.

Dated this 31st day of December, 1930.

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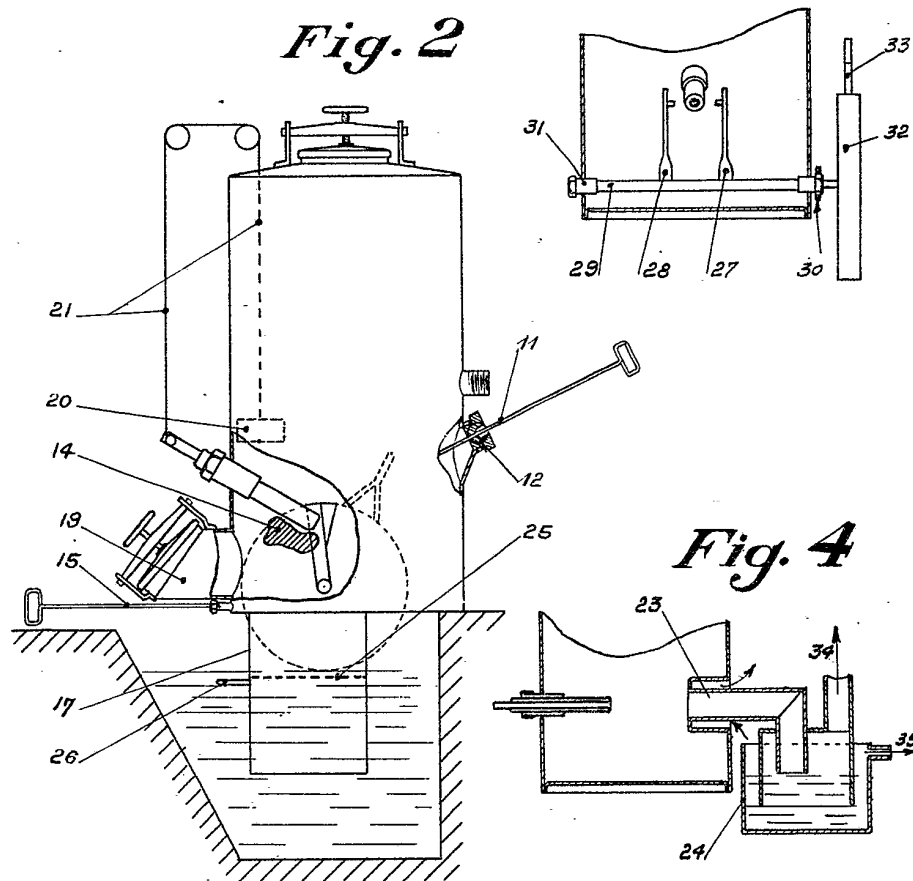
[This Drawing is a reproduction of the Original on a reduced scale.]

*Fig. 1*



*Fig. 3*

*Fig. 2*



*Fig. 4*

