

No. 647,826.

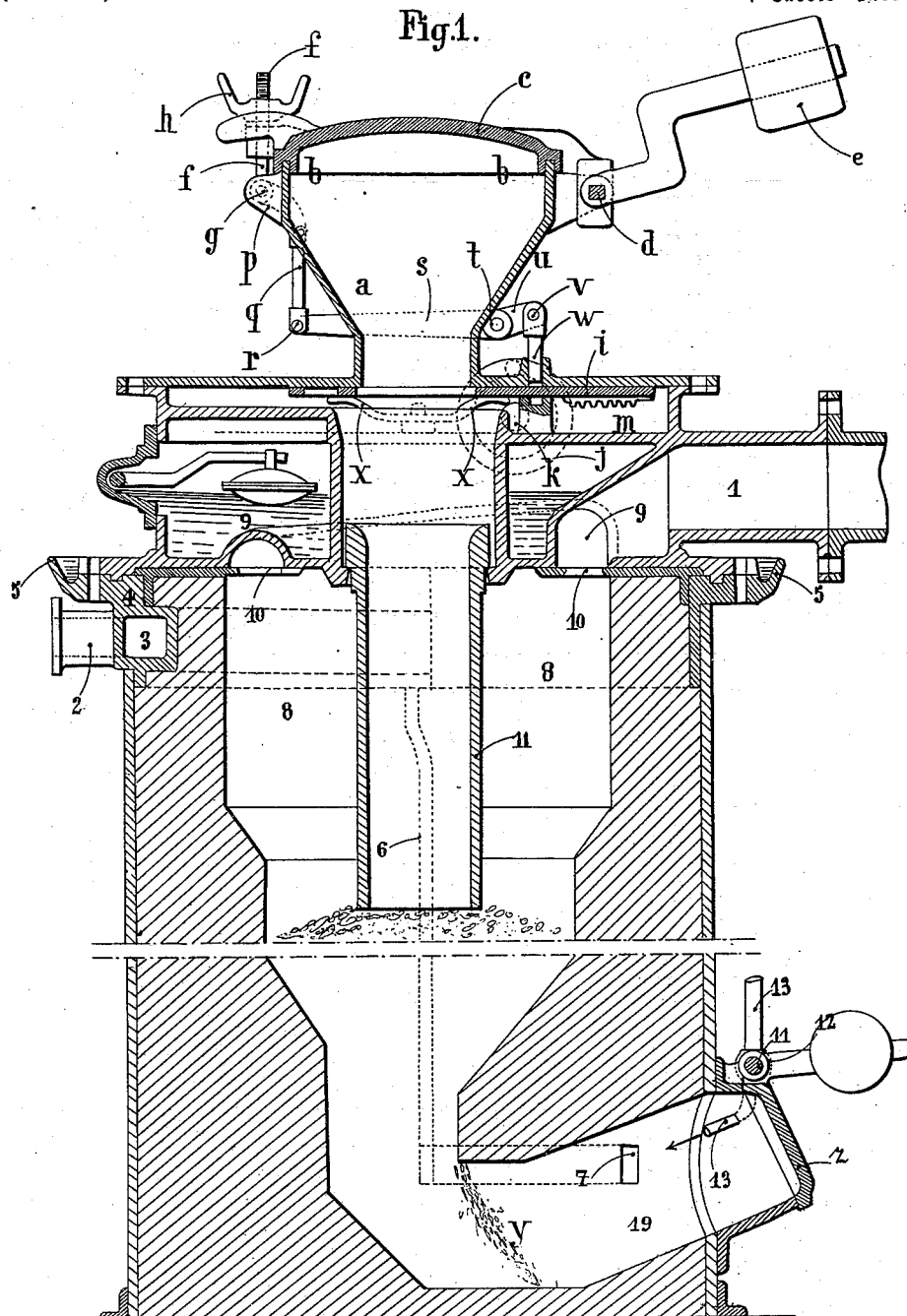
Patented Apr. 17, 1900.

N. A. GUILLAUME.
GAS GENERATOR.

(Application filed Dec. 27, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:
Superintendent
J. V. Cooper

Inventor
Narcisse A. Guillaume
James L. Norris

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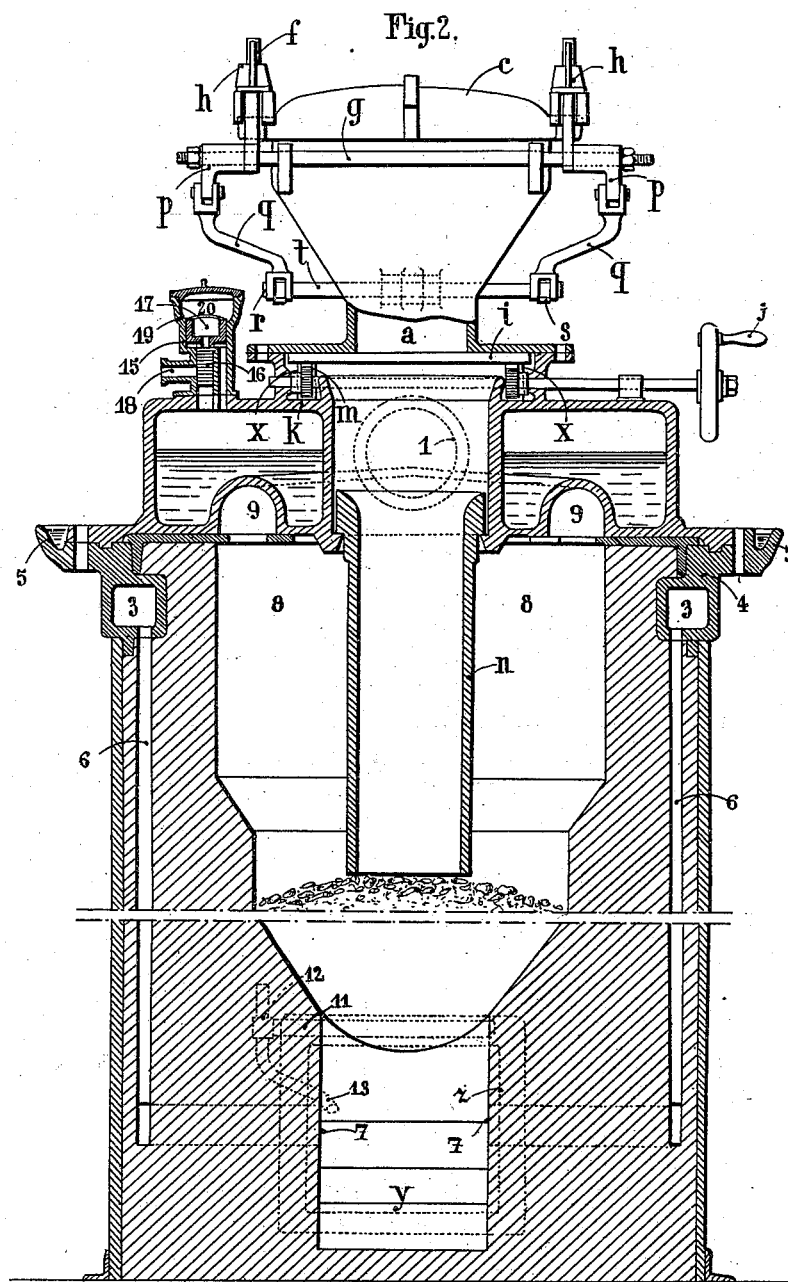
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(No Model.)

4 Sheets—Sheet 2.



Witnesses:
 W. Parker
 M. A. Cooper

Inventor
 Narcisse A. Guillaume

By James L. Norris.
 Atty

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Fig.3.

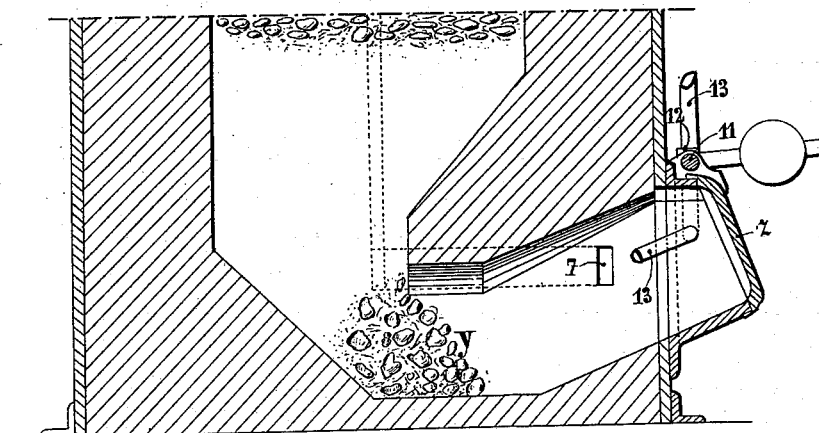
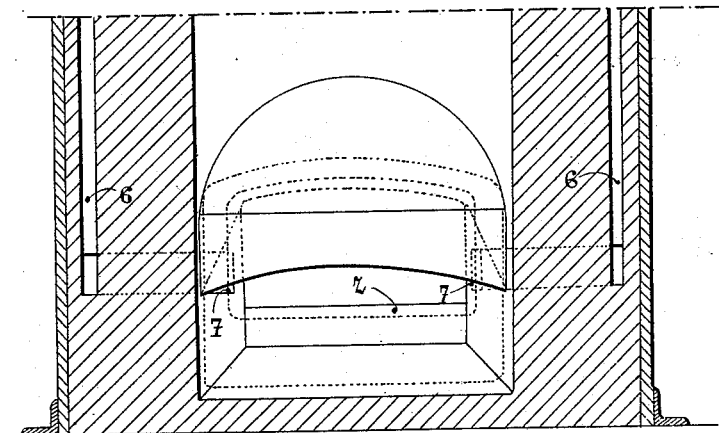


Fig.4.



witnesses:

W. Parker
M. A. Cooper

Inventor
Marcisse Guillaume

By James L. Norris
Atty.

No. 647,826.

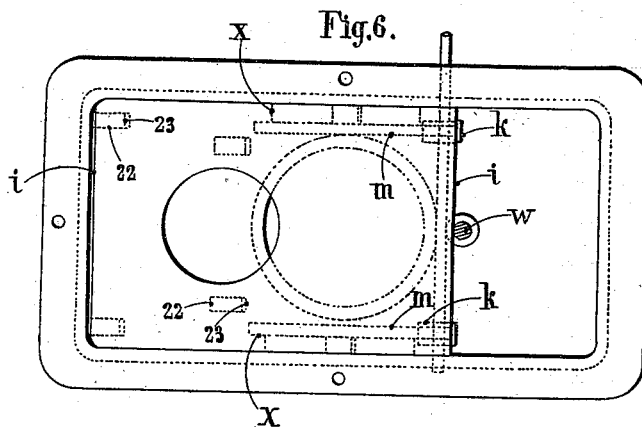
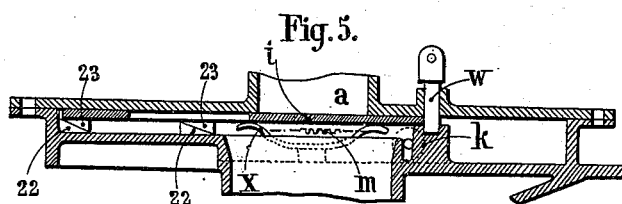
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4 Sheets—Sheet 4.



witnesses:
J. H. Parker.
M. O. Cooper

Inventor
Narcisse A. Guillaume

By James L. Norris
Atty

UNITED STATES PATENT OFFICE.

NARCISSE ALEXANDRE GUILLAUME, OF PARIS, FRANCE.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 647,826, dated April 17, 1900.

Application filed December 27, 1899. Serial No. 741,750. (No model.)

To all whom it may concern:

Be it known that I, NARCISSE ALEXANDRE GUILLAUME, a citizen of France, residing at 15 Rue du Louvre, Paris, France, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

This invention relates to that class of gas-generators which work by suction—that is to say, that class of gas-generators in which a mixture of steam and air drawn in either by a pump or directly by a motor is caused to traverse an appropriate fireplace or furnace.

My present invention consists in certain novel fuel-charging devices for such gas-generators, one object of which is to avoid the undesirable admission of air to the generator, which generator does not require a grate for the fuel, but which is provided with a sloping fireplace, in front of which is introduced the air and vapor mixture.

In order that my invention may be thoroughly understood, I will describe the same with reference to the accompanying drawings, in which—

Figure 1 is a transverse section through a gas-generator to which my improvements are applied. Fig. 2 is a vertical section at right angles to Fig. 1. Figs. 3 and 4 represent a modification in the form of the furnace. Figs. 5 and 6 show in section and plan the closed position of the slide.

A feed-hopper *a* for the fuel is provided, having a wide mouth or opening *t*, which is normally closed by a cover *c*, pivoted at *d* and provided with a counterweight or counterweights *e* for the purpose of facilitating the opening and closing of the said cover. The lower end of this hopper is provided with a closing-plate *i*, which can be slid horizontally to open and close the bottom of the hopper. The pivoted cover *c* is secured in its closed position by screw-bolts *f*, carried on a spindle *g*, pivoted to the body of the hopper, the said bolts being capable of being turned into position between ears on the cover *c*, thumb-nuts *h* being screwed onto the bolts firmly against these ears, so as to tightly secure the cover in its closed position. The pivoted screw-bolts *f* are connected by arms *p* and links *q*, as at *r*, to levers *s* on a spindle *t*, mounted in bearings on the hopper *a*, the said

spindle *t* having other arms *u* connected to a bolt *w* for locking the sliding door *i* at the lower end of the hopper in its closed position, so that the said sliding door cannot be moved to open the bottom of the hopper unless the screw-bolts are raised into position between the ears on the cover of the hopper. When the cover is closed and secured by the screw-bolts *f*, the sliding door can be opened by means of a hand-wheel *j* on a spindle-carrying pinion *k* in gear with racks *m* on the sliding door *i*. The sliding door can by this means be opened, so as to completely uncover the bottom of the hopper *a*, and thus allow any fuel that had been placed in the hopper to drop into a tube *n* and thence into the gas-generator proper, *o*. The movement of the sliding door *i* to open the bottom of the hopper is not possible so long as the screw-bolts are not in the position to secure the cover of the hopper in its closed position, so that the direct communication between the interior of the generator and the external atmosphere is prevented. Springs *x* are provided, having the tendency to force the slide plate or door *i* upward. The said door slides between two grooves in the table under which it slides, and when in its closed position it remains motionless in spite of the draft caused by the suction. In order to insure this immobility and rigidity of the plate *i* and to avoid the springs becoming bent by the effect of the suction and under the weight of the fuel placed upon the said slide plate or door *i*, I provide above the steam-chamber 14 a number of fixed wedges 22 and a corresponding number of similar wedges 23, fixed to the lower face of the sliding door *i*, so that when the door is moved into its closing position the wedges 23 on the door become wedged up against the fixed wedges and the door will be forced against the base of the feed-hopper *a*. As the springs *x* only work in a very slight measure, they do not become bent, and any return of air will be thus prevented. The fuel passed from time to time into the gas-generator drops gradually in a sloping direction, as show at *y*, Fig. 1, in front of the furnace-door *z*.

The mixture of air and vapor is supplied to the furnace under the action of the draft,

the suction taking place through the conduit 1 at the upper end of the generator. The air and the vapor are mixed by regulation-cocks in a proportion suitable to insure the proper function of the gas-generator and pass through a tubular nozzle 2 into a cast-metal box or chest 3, which extends around one-half of the circumference of the generator. The upper part 4 of this curved conduit forms a gutter 5, the object of which is to permit of the reception of a thin sheet of water, by the aid of which it would be possible to immediately discover any return of air in case of any defect in the joint between the gas-generator proper and the apparatus placed at its upper part. The mixture of air and vapor drawn in by suction at 1 into the curved box or chest 3 descends at both sides along the gas-generator by the conduits 6, Fig. 2, which discharge the gaseous mixture through suitable orifices 7 at both sides of the furnace. Under the effect of the suction through the conduit 1 the gases are transformed as they pass through the column of fuel *y o*, and they spread out in a chamber 8 above the fuel which surrounds the tube *n* in communication with the hopper through which the fuel enters the generator. The suction produced in the conduit 1 by the pump extracts the gas from the generator by the intermediary of a bell-shaped or arched passage 9, separated from the main gas-chamber 8 by means of an annular plate 10, provided with orifices of variable diameters, in such a manner that the resistance opposed to the traversing of the annular or bell-shaped passage and irregularly-perforated plate 10 will be nearly the same throughout the circumference. The effect of this arrangement is to produce an absolutely-regular draft across the whole mass or bulk of the contents of the generator, and consequently to prevent the drawn-up gases from traversing the column of fuel by following all the same course—namely, that offering the least resistance—whereby gases unsuitable for efficient use would be obtained.

When it becomes necessary to stoke the fire and to remove cinders and residues from the furnace, the furnace-door *z* is opened, which door is provided with a counterweight, the pivot 11 of which is connected in a suitable manner to the seat of a cock 12, placed on a secondary steam-conduit 13, forming a branch of the main conduit. By opening the furnace-door *z* the steam-cock 12 is at the same time opened, and in this manner a considerable influx of air momentarily imparted to the furnace through the opening of the door is accompanied by a quantity of vapor, which preserves to the gaseous mixture the proportions required for obtaining a good effect of the gas-generator.

Figs. 3 and 4 represent, by way of example, a modification in the arrangement of the gas-

generator, according to which the entrance to the furnace presents the shape of a vault and the capacity of the gas-generator is increased by dispensing with the conical reduced portion at the lower part. Above the steam-chamber 14 a pressure-regulating valve 15 is provided, which valve comprises two differential pistons 16 17, one of which, 16, covers the entrance of the exhaust-pipe 18, while the other, 17, allows steam to enter the chamber 20, placed at the upper part of the valve and provided with a series of small orifices 19. When the pressure in the steam-chamber 14 increases, the vapor, acting on the pistons 16 and 17, will lift them until the piston 16 covers the entrance of the exhaust-port 18. When the decrease in the pressure resulting from the loss of vapor is sufficient, the pistons will descend. In the opposite case the vapor, acting upon the other piston 17, will continue to lift the latter until it touches the cover of the chamber 20. At this moment the vapor will be enabled to freely pass under this piston in the said chamber and thence into the atmosphere through the orifices 19.

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

1. In a gas-generator operating by suction, a fuel-charging hopper closed at its upper end by a cover secured in its closed position by hinged bolts and nuts, or by a hinged bolt and nut; a sliding plate for closing the lower end of the hopper and a bolt or retaining device for securing the said plate in its closed position and means whereby the top of the hopper is prevented from being opened before the lower end of the said hopper is closed by the sliding plate substantially as hereinbefore described.

2. In a gas-generator operating by suction a fuel-charging device comprising a hopper closed at its upper end by a hinged lid or cover secured in its closed position by hinged bolts and nuts, a sliding plate for closing the bottom of the hopper and a bolt or retaining device for securing the said plate in its closed position, a system of levers connecting the securing-bolts for the top cover to the bolt-retaining device for the sliding plate or bottom cover so that both covers cannot be open at the same time and springs arranged beneath the sliding plate to press it against the bottom of the hopper to prevent vibrations of the plate by the action of the suction pump or motors substantially as hereinbefore described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

NARCISSE ALEXANDRE GUILLAUME,

Witnesses:

EDWARD P. MACLEAN,
HIPPOLYTE JOTTE.