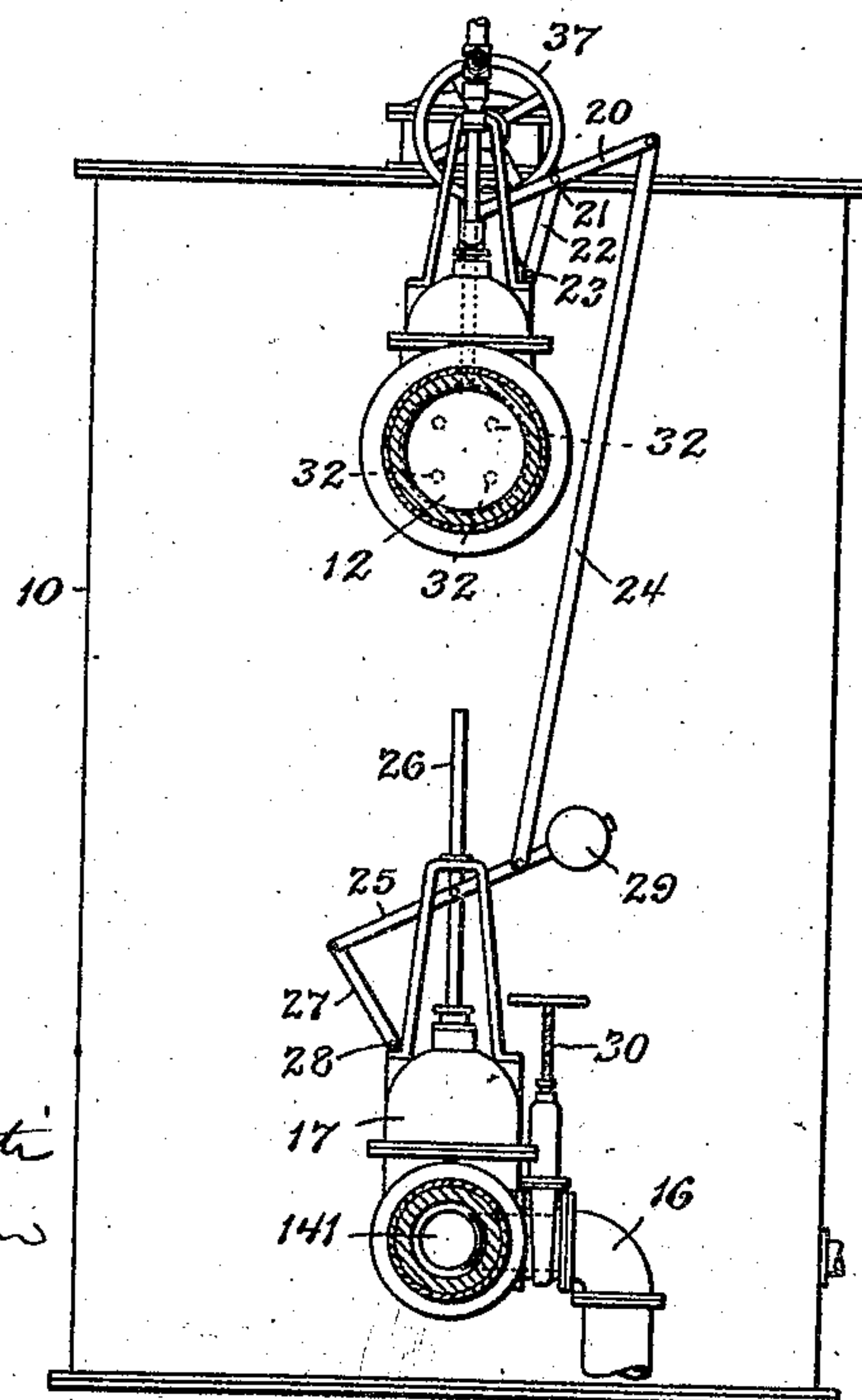
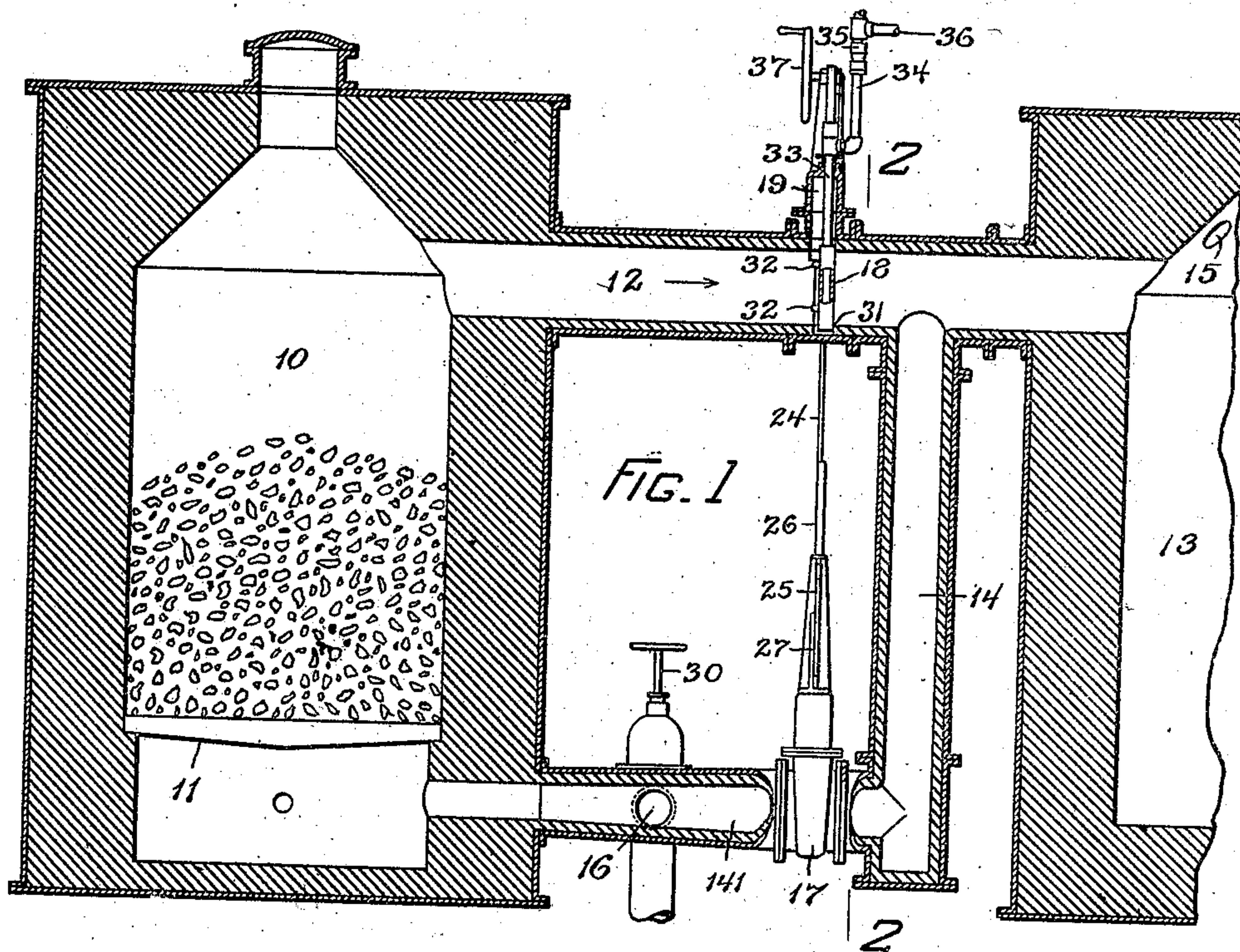


No. 894,483.

H. N. CHENEY. PATENTED JULY 28, 1908.  
WATER GAS GENERATOR.  
APPLICATION FILED APR. 10, 1908.

2 SHEETS—SHEET 1.



WITNESSES  
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2 SHEETS—SHEET 2

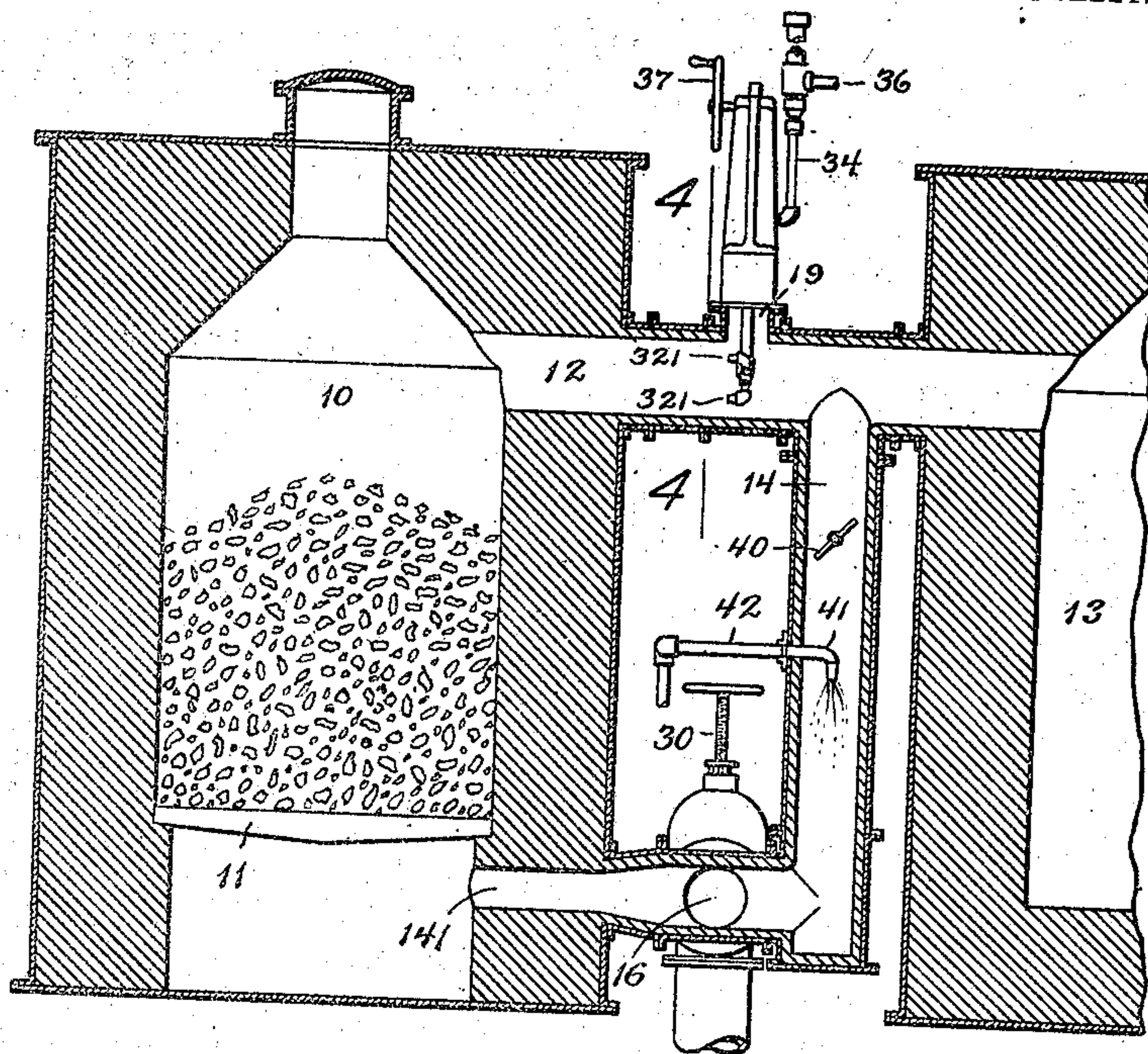


FIG. 3

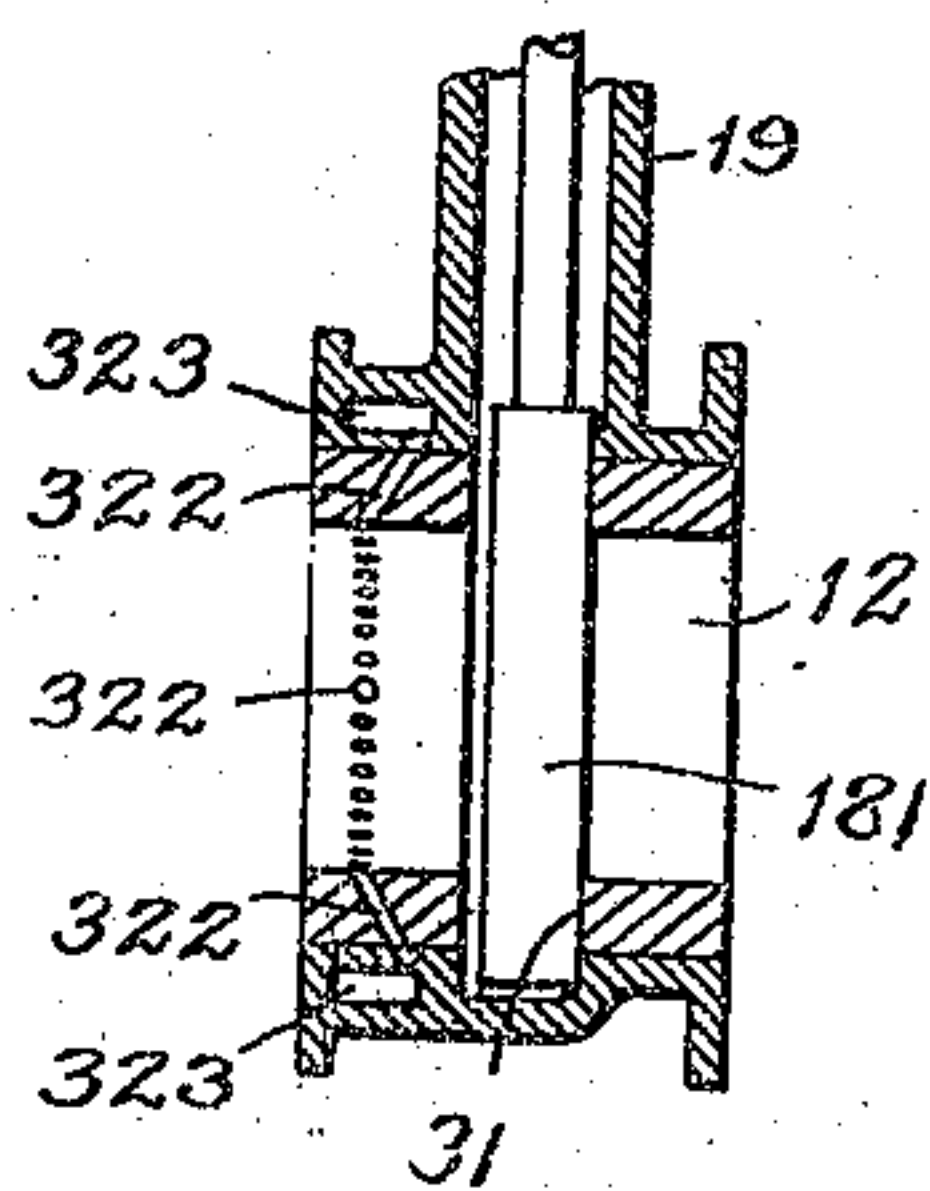


FIG. 5

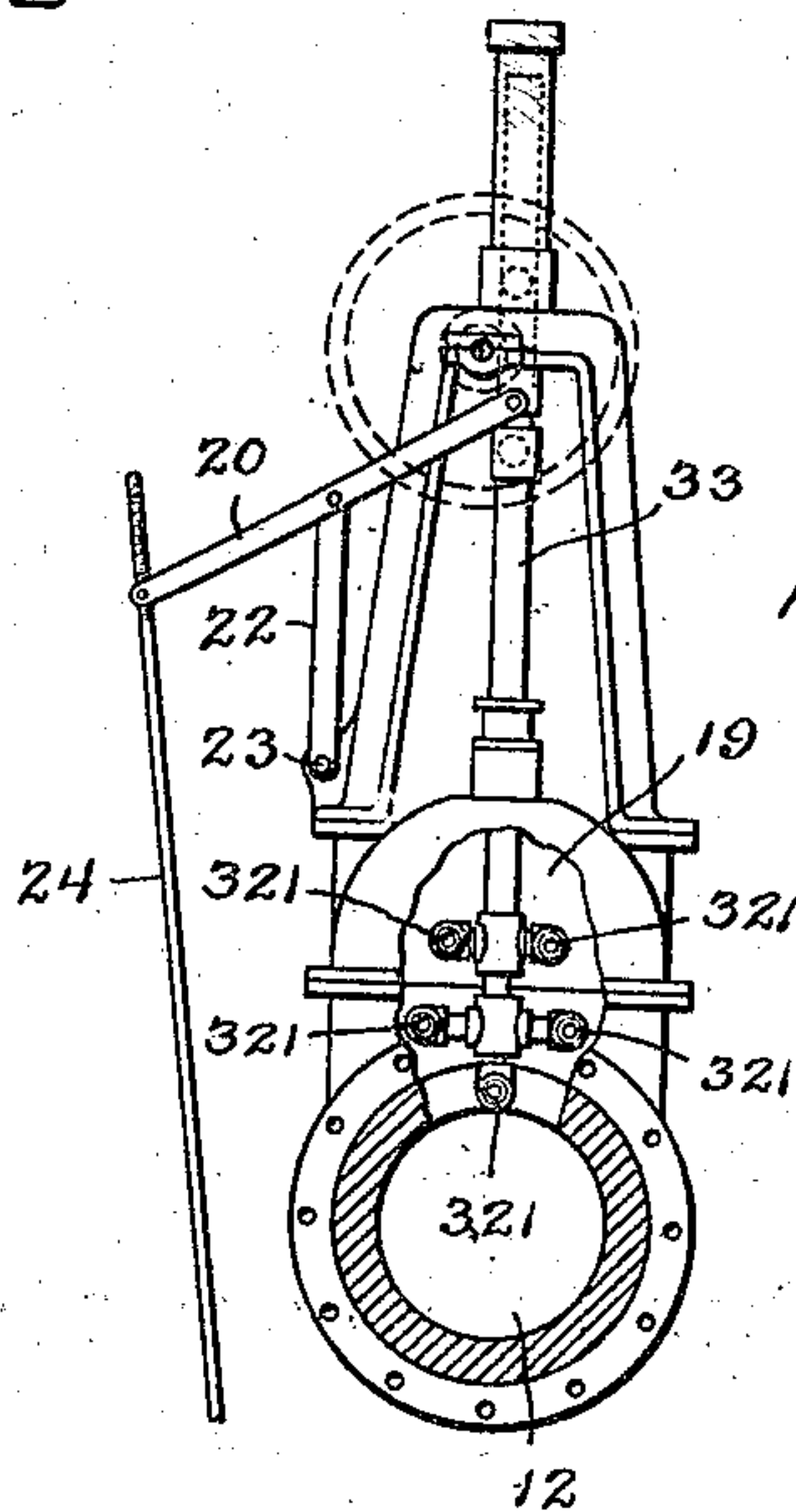


FIG. 4

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# UNITED STATES PATENT OFFICE.

HERBERT N. CHENEY, OF BOSTON, MASSACHUSETTS.

## WATER-GAS GENERATOR.

No. 894,483.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed April 10, 1908. Serial No. 426,254.

*To all whom it may concern:*

Be it known that I, 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 relates to apparatus for generating water gas and refers particularly to that type of such apparatus having means whereby the steam supplied to the fuel is caused to pass either upward or downward through the generator proper, the object of passing it downward being to utilize the unconsumed portion of the fuel bed following from the preceding upward course of the draft.

In apparatus of the character mentioned, it has been customary to employ two valves, an upper one in the outlet from the generator, and a lower one in the branch which connects the outlet at a point beyond the upper valve with the generator below the grate of the latter, the two valves being connected to open and close simultaneously but alternately; that is, one valve being always open when the other one is closed. The upper valve is subject to such intense heat that it is liable to become burned out or to be so warped that gas or steam can pass by it when it is intended that the flow shall only be downward through the fuel bed in the generator.

The object of my invention is to provide an improved structure either dispensing entirely with the upper valve or preventing gas from passing the upper valve in the wrong direction when said upper valve is in position intended to close the upper or main outlet.

To these ends, my invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

Of the accompanying drawings in which similar reference characters indicate the same or similar parts in all of the views, Figure 1 represents a transverse section through so much of the apparatus embodying my invention as may be necessary to enable the said invention to be understood. Fig. 2 represents a section on line 2—2 of Fig. 1, looking toward the left. Fig. 3 is a

view similar to Fig. 1, but showing modifications hereinafter described. Fig. 4 represents a section on line 4—4 of Fig. 3 on a larger scale. Fig. 5 is a detail view representing another modified structure of the steam supply for the upper or main outlet.

Referring first to Figs. 1 and 2, the generator is indicated at 10, said generator having a fuel grate 11 and an outlet 12 leading to the usual carbureter 13. A branch connects the outlet 12 with the space below the grate 11 of the generator, said branch comprising a vertical portion 14 and a horizontal portion 141.

At 15 is represented an inlet for air to the carbureter, and at 16 an air inlet is shown communicating with the portion 141 of the branch.

As is usual in gas apparatus of this type, there is a slide or gate valve in the lower or branch portion, the casing of said valve being indicated in Fig. 1 at 17. In said Fig. 1, I also show a valve 18 mounted to close the outlet 12. According to one embodiment of my present invention, this valve 18 is made hollow for a purpose which will be presently described. Said valve is adapted to be raised into the lateral recess or chamber 19. The stem of said valve is connected to the inner end of a lever 20 which is pivoted at 21 to the upper end of a link 22, the latter being pivoted at 23 to the valve casing. The outer end of the lever 20 is connected by a link 24 to a lever 25, which at about its mid length, is pivoted to the stem 26 of the lower valve, one end of said lever 25 being pivotally connected to a link 27, the lower end of which is pivoted to the valve casing 17, the other end of the lever 25 being provided with the usual balance weight 29. The stem of the valve, which controls the air inlet 16, is indicated at 30. With the exception of the upper valve being made hollow, the construction, so far described, is well known. The connections between the two valves is such that when one is open the other is closed. The operation of the valves is usually effected by a hand wheel such as indicated at 37, which hand wheel has a pinion engaging a rack carried by the stem of the upper valve.

In the operation of gas generators of this



type, it is essential that the upper valve shall have at least one seat such as indicated at 31 against which said valve will certainly fit closely when the valve is in its lower position. If, under any circumstances, there should be a tendency of the gas to flow in a direction the reverse of the arrow shown in Fig. 1, no harmful result would follow. But it is essential that, when the upper valve is lowered, there shall be no movement of gas or steam in the direction of the arrow in said Fig. 1. When the upper valve is new, it may fit its seat 31 sufficiently close for this purpose. But when it has been subjected to the intense heat which it usually receives, said upper valve is liable to be so burned out or warped that it no longer properly serves its purpose. I therefore propose to either entirely dispense with said upper valve or to add thereto means which will prevent the leakage of gas past said valve when it is lowered. In the embodiment of the invention illustrated in Figs. 1 and 2, the valve 18 is made hollow, as has been stated, and is provided with steam nozzles or nipples 32 which project in a direction toward the generator. And the stem 33 of the said valve is made hollow and is provided with a branch pipe 34 passing through a stuffing box 35 so as to have a sliding fit therein, the connection with the steam supply being made through a pipe 36, and the construction being such that the valve 18 can be raised or lowered without disturbing the steam connection. The valve which will enable the steam to be absolutely shut off or turned on is not indicated.

My invention, which comprises the use of a fluid jet device mounted in the outlet of the gas generator so as to retard or reverse the flow of gas through said outlet, renders it possible to entirely dispense with the upper valve and in fact to dispense entirely with any tight fitting valves in the outlet or the branch.

Whether the flow of gas will be reversed or retarded depends, of course, upon the pressure with which the fluid issues from the jet devices. Sometimes it is desirable to check the outflow through the upper passage 12, without reversing the direction of movement of the gas. This can be done by admitting the supply of fluid at a pressure less than that which would be required to force the gas to move downward through the generator.

In the embodiment of the invention shown in Fig. 3, there is no valve in the branch, although a damper 40 may be preferred in the vertical portion 14 of the branch. Arranged in said vertical portion 14 of the branch and pointing downwardly, is a steam jet device 41, the supply pipe for which is indicated at 42, the supply being controlled by any suit-

able valve not shown. Connections, such as have been described and illustrated in connection with the upper and lower valves shown in Figs. 1 and 2, may be employed to alternately control the supply of steam, which is directed downwardly in the branch section 14, and the supply of steam which is directed toward the generator in the main outlet 12.

As clearly shown in Figs. 3 and 4, the usual valve in the outlet is entirely dispensed with, but a jet device is employed which may be raised into or lowered from the lateral recess or chamber 19. Said jet device may consist of a group of nozzles 321 carried directly by the lower end of a steam pipe which is the same in construction and operation as the hollow valve stem 33 hereinbefore described.

With the apparatus constructed as shown in Fig. 3, steam, which is to pass down through the fire bed, is admitted through the jets 321, and steam, which is to pass up through the fire bed, is admitted through the jet device or nozzle 41, the velocity of the steam, in either case, causing it and the gas to flow in the desired direction. With the structure shown in Fig. 3, no air inlet for the carbureter is needed, it being possible to supply sufficient air through the inlet 16, the damper 40 being employed to control the amount of air which passes to the carbureter.

In Fig. 5, I illustrate a different means for supplying steam whether a valve is located adjacent to the jet device or not. In said figure, the structure is such that steam is supplied through a circular series of inclined ports 322, the steam coming from an annular supply passage 323, which in turn receives its steam through any suitable valve-controlled pipe. The ports 322 are inclined in such a direction that, when steam is being forced through them, no gas can pass from the top of the generator through the outlet 12, whether a valve such as shown at 181 is present or not, or whether such valve, if present, has become warped.

I claim:—

1. A gas generator having a jet device in its outlet directed toward the generator whereby the flow of gas through said outlet and generator may be retarded or reversed.

2. A gas generator having its outlet provided with a lateral recess or chamber, and a jet device directed toward the generator and movable to occupy said recess or to a position in the path of gas passing through said outlet.

3. A gas generator having an outlet to the carbureter and having a branch connecting said outlet with the space below the fuel bed of the generator, and a jet device directed toward the generator and adapted to prevent the flow of gas from the upper portion of the generator directly to the carbureter.

4. A gas generator having an outlet to the carbureter and having a branch connecting said outlet with the space below the fuel bed of the generator, a jet device adapted to prevent the flow of gas from the upper portion of the generator directly to the carbureter, and a jet device adapted to prevent the flow of gas through the branch from the space below

the fuel bed, each of said jet devices being directed toward the generator.

In testimony whereof I have affixed my signature, in presence of two witnesses.

HERBERT N. CHENEY.

Witnesses:

JOHN SHEA,  
WM. S. LYONS.

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