

No. 632,817.

Patented Sept. 12, 1899.

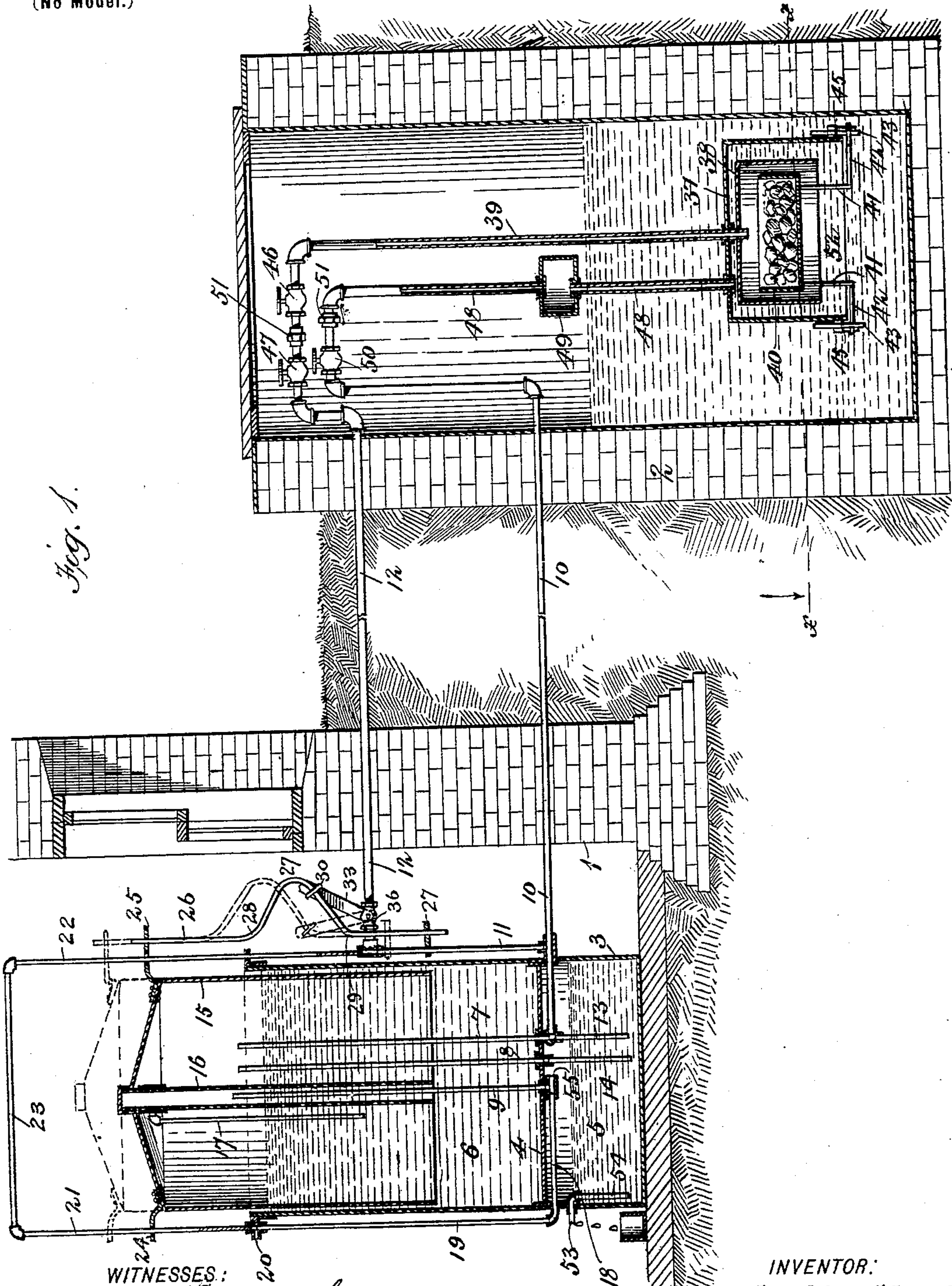
T. H. J. LECKBAND.

GAS GENERATOR.

(Application filed Dec. 17, 1898.)

2 Sheets—Sheet 1.

(No Model.)



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2 Sheets—Sheet 2.

Fig. 2.

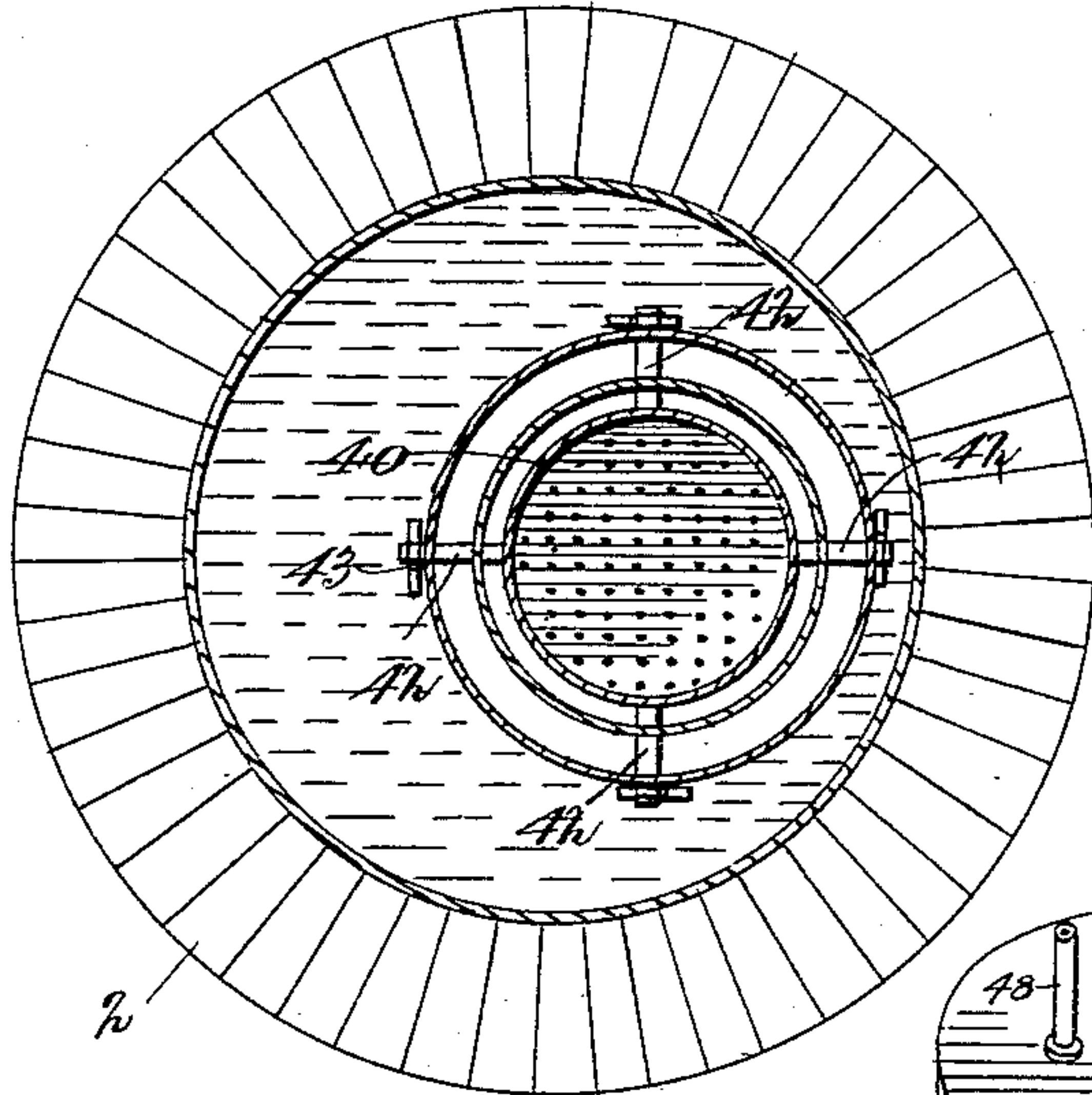


Fig. 3.

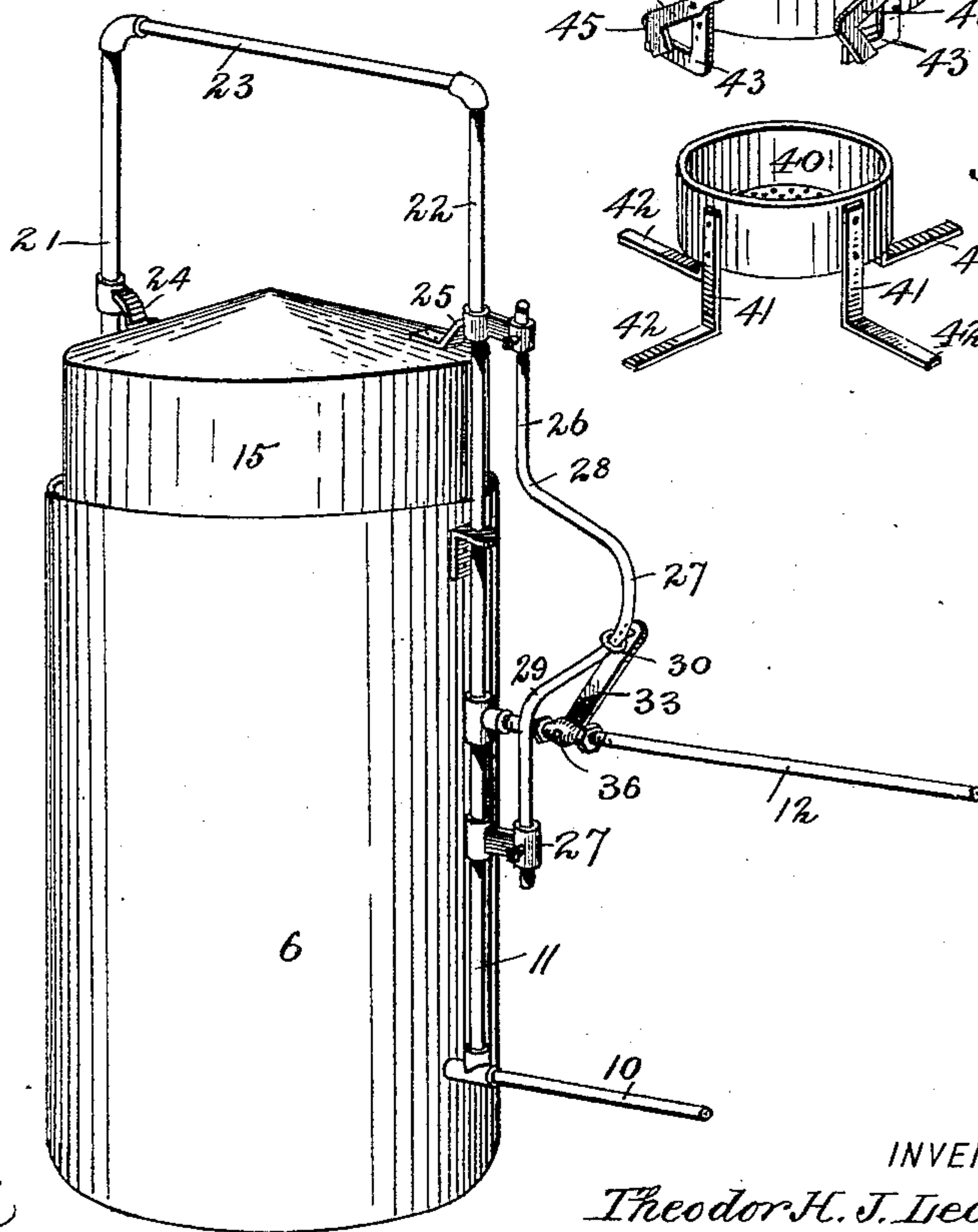


Fig. 4.

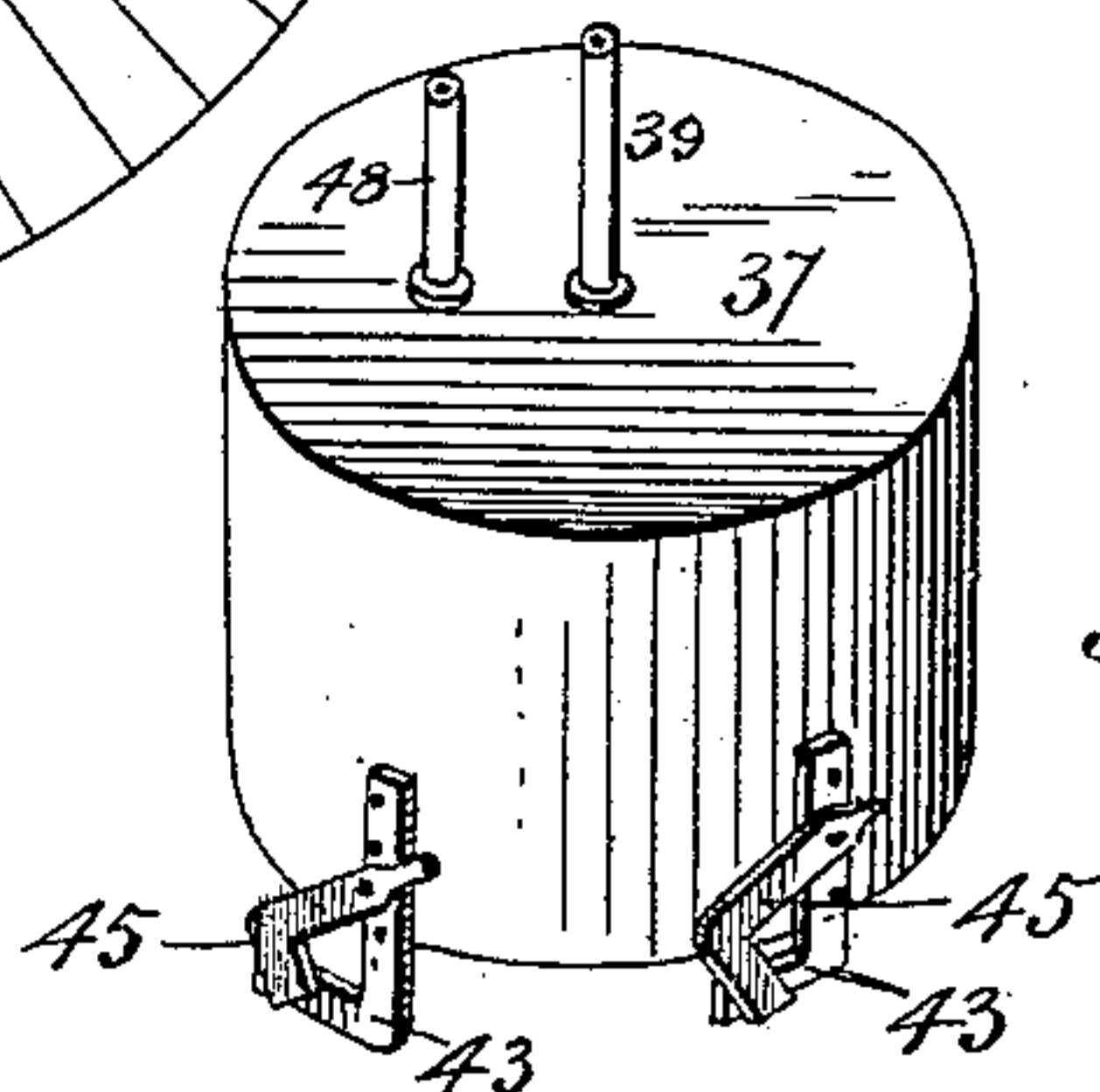


Fig. 6.

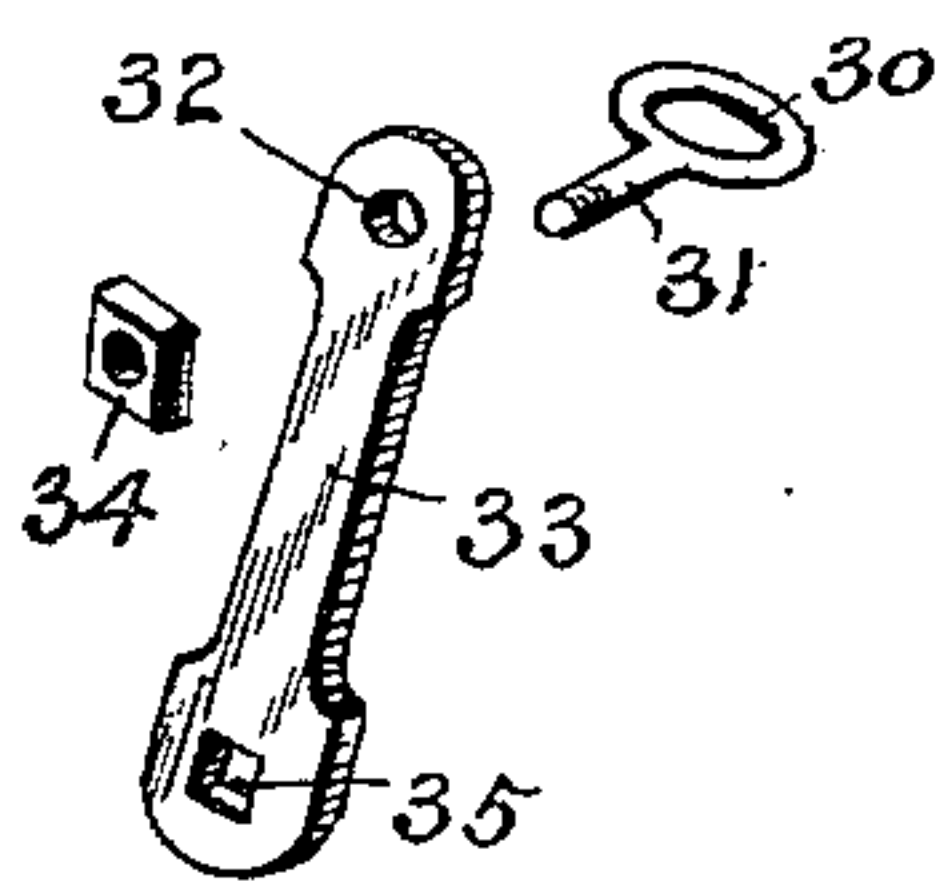
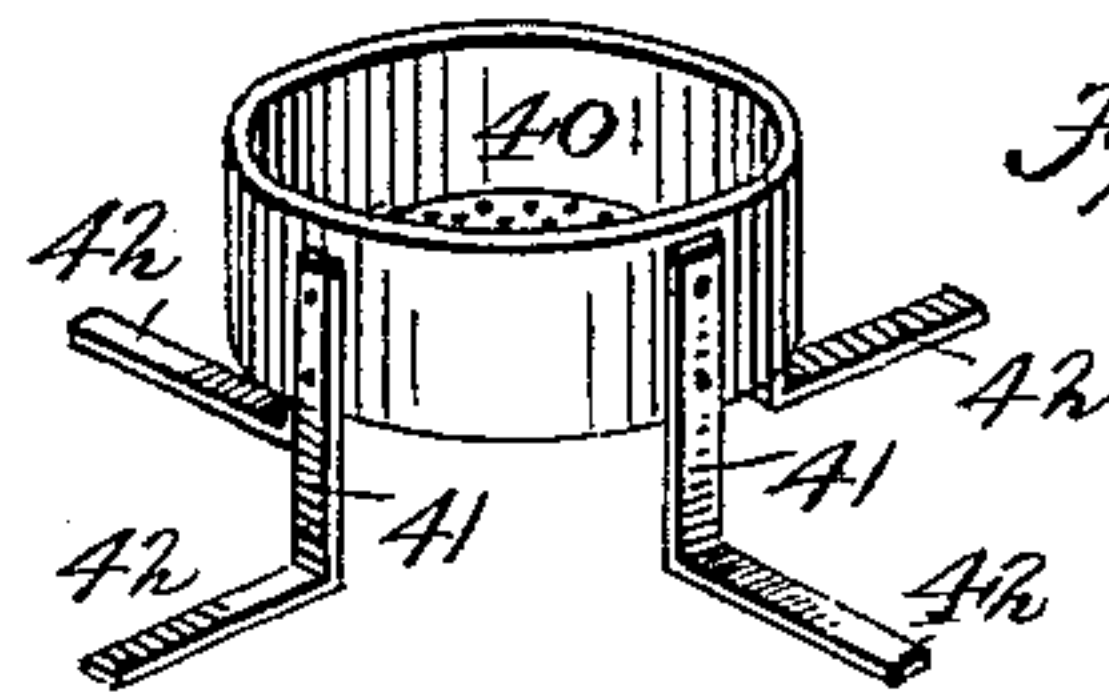


Fig. 5.

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THEODOR H. J. LECKBAND, OF ADAIR, IOWA.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 632,817, dated September 12, 1899.

Application filed December 17, 1898. Serial No. 699,582. (No model.)

To all whom it may concern:

Be it known that I, THEODOR H. J. LECKBAND, a citizen of the United States, residing at Adair, in the county of Adair and State of Iowa, have invented certain new and useful Improvements in Gas-Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in gas-generators, the object being to provide reliably efficient means for generating gas from the well-known substance termed "calcium carbid" and additional means for automatically controlling the quantity of gas thus produced, whereby a substantially uniform quantity and pressure of gas will be maintained in the holder, which may consist of the usual telescoping sections termed the "tank" and "bell."

Other objects and advantages will be made fully apparent from the following specification and by reference to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a complete acetylene-gas plant, some of the parts being shown in side elevation. Fig. 2 is a longitudinal sectional view of Fig. 1 on line $x-x$. Fig. 3 is a perspective view of my improved gas-holder provided with means for automatically though temporarily cutting off further flow of gas when the holder is filled. Fig. 4 is a perspective view of the body-section or outer casing of my gas-generator. Fig. 5 is a detail view in perspective showing the preferred construction for the arm designed to automatically control the valve which regulates the flow of gas into the holder. Fig. 6 is a perspective view showing the carbid-receptacle proper designed to be received by the body-section shown in Fig. 4.

While I shall in the following specification describe the preferred construction or manner of materializing the several parts of my invention, it will be understood that any substantial equivalent of said parts is comprehended by me, and I do not therefore wish to be confined strictly to the exact showing herein set forth.

The several elements of my invention and

the necessary coöperating accessories therefor will for convenience be designated by numerals, 1 indicating the wall of the building in which my gas-holder is located, while 2 designates the wall of a cistern or tank preferably located at a remote distance from the building in which the gas is to be consumed.

The gas-holder 3 is constructed, so far as its exterior appearance is concerned, substantially in the usual manner, while interiorly it is provided with the false bottom 4, thus separating the holder into two compartments 5 and 6, it being understood that the false bottom 4 is intact throughout, except that it is provided with certain perforations designed to permit the passage of the pipes 7, 8, and 9, the former being directly connected with the supply-pipes 10, 11, and 12, and is also provided with the drainage or drip pipe 13, which extends nearly to the bottom of the chamber 5 and by means of which any water in the pipes 7, 10, or 11, due to condensation, will be conveyed into said chamber.

It will be understood that a series of pipes 7 may be provided, each having proper connection with the pipe 10, the result being that a greater area of cooling surface will be presented by the water or other sealing liquid contained in the chamber 6. The service-pipe 8, together with the pipes 7 and 9, extend above the sealing liquid in the chamber 6, and the former is also provided with the downward extension 14, similar in extent and function to the extension 13 just described, it being understood that suitable pipe connections leading to the burner are made with the pipe 8, preferably near the false bottom 4, it being deemed unnecessary for the purpose of this application to show such pipe connection.

The pipe 9 provides a safety-vent for the escape of an excessive accumulation of gas within the holder or bell 15, and said pipe is loosely received by the depending sleeve 16, secured at its upper end preferably to the central portion of the top of the bell, the lower or open end of said sleeve being designed to always extend below the surface of the liquid contained in the chamber 6, the extent or reach of said sleeve being coincident with the length of the bell. The sleeve 16 is provided

with the auxiliary pipe 17, which is of less extent than said sleeve, and the lower end thereof is lifted out of the sealing position when the bell is completely filled, thereby permitting the excess of gas to escape through said pipe into the sleeve 16 and thence down through the pipe 9 into the continuation 18 thereof, disposed upon the under side of the false bottom, the gas passing from said continuation upward through the waste-pipe 19 and out through the vent 20 into the air, thus insuring that an undue quantity of gas introduced into the bell will not result disastrously thereto.

Extending upward above the ends of the pipes 11 and 19, respectively, are the standards 21 and 22, properly connected together at their upper ends, as by the section 23, and designed to ride upon and be guided by said standards are the arms or brackets 24 and 25, secured upon opposite sides of the top of the bell 15. The bracket or guiding-arm 24 is provided with an aperture designed to loosely receive the standard 21, while a similar aperture for the reception of the standard 22 is provided in the bracket 25, the outer end of which is sufficiently extended to enable the upper end of the controlling or actuating rod 26 to be firmly attached thereto, while the lower end of said rod is permanently attached to the bracket or guide 27, the inner end of which is provided with an aperture designed to loosely receive the pipe 11, upon which it is adapted to be reciprocated, as will be hereinafter more specifically pointed out.

Near the middle portion of the rod 26 I form the laterally-extending curved section 27 and the curves 28 and 29, and designed to cooperate with said bends is the swiveled guide consisting of the ring 30, having the partly-threaded stem 31, the unthreaded portion thereof being designed to be loosely received by the aperture 32, provided in the lever 33, and be held in such position, as by the nut 34.

The lower end of the lever 33 is provided with a suitable aperture 35, designed to receive the valve-stem of an ordinary globe-valve, as indicated by 36, though any preferred variety of valve, it will be understood, may be adopted.

Designed to cooperate by suitable pipe connections with the supply-pipes 10 and 12 is the gas-generator, which I will now describe in detail and which by reference to Fig. 1 will be found to consist of the outer casing or body-section 37 and the inner casing 38, the latter being secured to the outer casing by means of the downwardly-extending end of the pipe 39, which is properly joined to both the outer and inner casings above mentioned, thereby holding them permanently in union with each other.

Designed to be loosely received within the inner casing 38 is the carbid receptacle or holder proper, 40, which by reference to Figs. 1, 2, and 6 will be seen to consist of a vessel

which is smaller in diameter than said inner casing and provided with the legs 41, each having the horizontally-disposed terminals 42. In order that the carbid-holder may be held in its operative position within the inner casing 38, I provide upon the outer casing or housing 37 the brackets 43, each of said brackets being substantially L-shaped in form and having their lower ends disposed slightly below the edge of said housing, thereby providing the horizontally-disposed supporting ends 44, upon which one of the terminals 42 may rest, and in order that said terminals may be held against slipping off the free end of the supporting ends 44 I provide a locking device consisting of the pivoted hooks or latches 45, which by reference to Fig. 4 will be seen to have a capacity to detachably though reliably secure the carbid-holder in its operative position.

By reference to Fig. 1 it will be observed that the pipe 39 extends into direct communication with the carbid-chamber and is therefore adapted to receive and convey the freshly-generated gas through the valves 46 and 47 and thence into the pipe 12. The space or opening between the housing 37 and the inner casing 38 is directly in communication with the exit-pipe 48, which latter is provided with the preferably cylindrical chamber or enlarged section 49, the pipe 48 being placed in communication with the pipe 10 by means of the valve 50. By reference, therefore, to Fig. 1 it will be observed that the generator may be entirely cut off from communication with the holder and removed for the purpose of replacement or repair by means of the unions 51.

It will of course be understood that the arrangement of the several parts herein described may be varied at will, as the upward extension formed by the pipes 39 and 48 and the valves 46, 47, and 50 is made to render the valves more readily accessible to the operator when placing the generator in its operative position.

Having thus fully described the details of construction involved in the production of a complete and operative gas generating and holding plant, the operation thereof may be said to be as follows: The carbid is placed in the receptacle 40 and the latter locked in its operative position within the inner casing 38 by means of the hooks or latches 45, when the entire device thus combined is lowered into a tank or cistern of water, it of course being understood that the unions 51 are disconnected and the valve 46 left open. After the generator has been lowered for a short time beneath the water the gas will be detected as escaping through said unions, when the valve 46 should be closed and both of said unions so adjusted as to form a close connection between the pipes 10 and 12 and the pipes 48 and 39, respectively. After a connection has thus been established between the generator and the holder the gas will

accumulate and be directed into the holder through the pipes 39, 12, 11, 10, and 7 and the holder or bell 15 will be completely filled and incidentally elevated. The elevation of the bell 15 will take with it the bracket or arm 25 and the actuating-rod 26, thus causing the latter to act upon the lever 33 and close the valve 36, the change of position of the lever 33 being indicated by dotted lines in Fig. 1. After the flow of the gas from the pipe 12 has been cut off the resistance of further inflow of water into the carbid-receptacle will be greatly increased, thereby checking the generation of the gas, though such generation will continue in a limited degree; but as the gas cannot pass upward through the pipe 39, owing to the closing of the valve 36, it must pass downward under the lower edge 52 of the inner casing 38 and thence upward between the inner casing and the housing 37 and thence upward through the pipe 48, carrying with it more or less water until the enlargement or chamber 49 is reached, when the gas will become separated from the water and the former will continue its journey to the holder through the valve 50 and the pipes 10 and 7. Owing to the resistance presented to the passage of the gas by thus directing it under the lower edge 52 of the inner casing 38 and thence upward through the water it is clear that the generation of gas will gradually diminish and practically entirely cease, though by this provision just described the gas which is generated after the closing of the valve 36 is not lost, but safely housed within the holder.

Should for any reason there be a sudden or undue increase of the quantity of gas, it is obvious that the excess will not damage the holder, inasmuch as the surplus will pass off through the auxiliary pipe 17 when the bell becomes too greatly elevated. It is further apparent that when the gas within the bell 15 has become consumed said bell will by gravity settle downward and carry with it the actuating-rod 26, which will so act upon the lever 33 through the mediation of the swiveled ring 30 that the valve 36 will be again opened, when less resistance will be presented to the flow of the water into the carbid-holder, the result being that the increased quantity of gas generated will freely pass upward through the pipe 39 and into the holder through the pipe 12 and its connections, my improved gas-generator thus having the capacity to repeat the operation just described *ad infinitum*.

In order that the water in the receptacle 5 may not rise into contact with the false bottom, I provide the drainage-pipe 53, having the downwardly-extending stem 54, designed to act as a seal, and thus prevent the accumulation of gas in the upper portion of the chamber 5 from escaping through said pipe, it being understood that an opening 55 is provided at the point of junction of the pipes 9 and 18 in order to provide for the escape of the accu-

mulated gas in said chamber, inasmuch as such gas may pass outward through the pipe 19 and the vent 20.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic cut-off for gas-holders, a guiding-standard 22, a gas-holder having a bracket through which said standard loosely passes, a valve-actuating rod having a bend rigidly attached to said bracket, a supply-pipe with a valve therein and means connecting said rod and valve consisting of a link or lever having a swivel or eye at one end encircling said valve-rod and having an aperture at the other end to receive the stem of said valve, all combined as set forth.

2. In an automatic cut-off for gas-holders, a guiding-standard 22, a gas-holder having a bracket through which said standard loosely passes, a supply-pipe having a valve therein, a controlling valve-rod rigidly attached to said bracket and having a rigid bracket on its lower end sliding on said standard, said valve-rod having a central outward curve, and means connecting said valve-rod and said valve consisting of a link or lever having a swivel or eye at one end encircling the valve-rod and an aperture at the other end to receive the stem of said valve, all combined as set forth.

3. In an automatic cut-off for gas-holders, the combination with the bell and tank, of an arm secured to the former; a depending curved rod secured to said arm; a valve carried by the supply-pipe and provided with an operating-lever; a ring encircling said rod and having a stem loosely fitting an aperture in said lever and means to secure said stem in place, as and for the purpose set forth.

4. In an automatic cut-off for gas-holders, a guiding-standard 22, a gas-holder having a bracket through which said standard loosely passes, a supply-pipe having a valve therein, a centrally-curved valve-actuating rod rigidly attached to said bracket and having a rigid bracket at its lower end sliding on said standard, and means connecting said rod and valve consisting of a link or lever having a removable screw-eye in one end, said eye surrounding said valve-rod and having an aperture in the other end to receive the stem of the valve, all combined as set forth.

5. A gas-generator consisting of an outer and inner casing both open at the bottom; a delivery-pipe extending through said outer and inner casing and adapted to hold the same together; an auxiliary delivery-pipe extending through the outer casing and into communication with the open space between the outer and inner casing; a carbid-holder designed to be received by said inner casing and means to lock said holder in place, as and for the purpose set forth.

6. In a gas-generator, a double-walled housing open at the bottom and having a space between said walls; a pipe extending through

said walls; a carbid-holder fitting said housing and in communication with said pipe and an auxiliary pipe passing through only the outer wall of the casing and connecting with said space, whereby the gas will be delivered from said space when the pipe leading to the carbid-holder is closed, as and for the purpose set forth.

7. In a gas-generator, the combination of a double-walled housing having an open lower end, said walls having a space between them; a delivery-pipe passing through both walls of said housing; an auxiliary pipe communicating with said space; a carbid-holder fitting said housing and communicating with said delivery-pipe, said holder being provided with legs having lateral extensions; supporting-brackets secured to the housing and adapted to receive said extensions; locking-hooks designed to hold said extensions upon said brackets, as and for the purpose set forth.

8. In a gas-generator, the combination with a holder, and means substantially as described to check and restore the flow of gas thereto, of a gas-generator and suitable pipe connections, said generator consisting of a double-walled housing open at the bottom; a

carbid-holder fitting said housing and means to hold the same in place; a main and auxiliary delivery-pipe, the former leading direct from the carbid-receptacle and the latter communicating with the space between said double walls whereby when the main pipe is closed, the auxiliary pipe will receive and deliver the gas as it passes upward through the water and under the edge of said inner wall, as and for the purpose set forth.

9. In a gas-generator, the combination with a double-walled housing having an open lower end; a carbid-holder fitting the same and means to hold the same in place; a main and auxiliary delivery-pipe, the former passing through said housing and the latter communicating with the space between said walls and provided with an enlarged section adapted to arrest the water and permit the gas to pass upward, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

THEODOR H. J. LECKBAND.

Witnesses:

JOHN PAETOM,
WM. LECKBAND.