

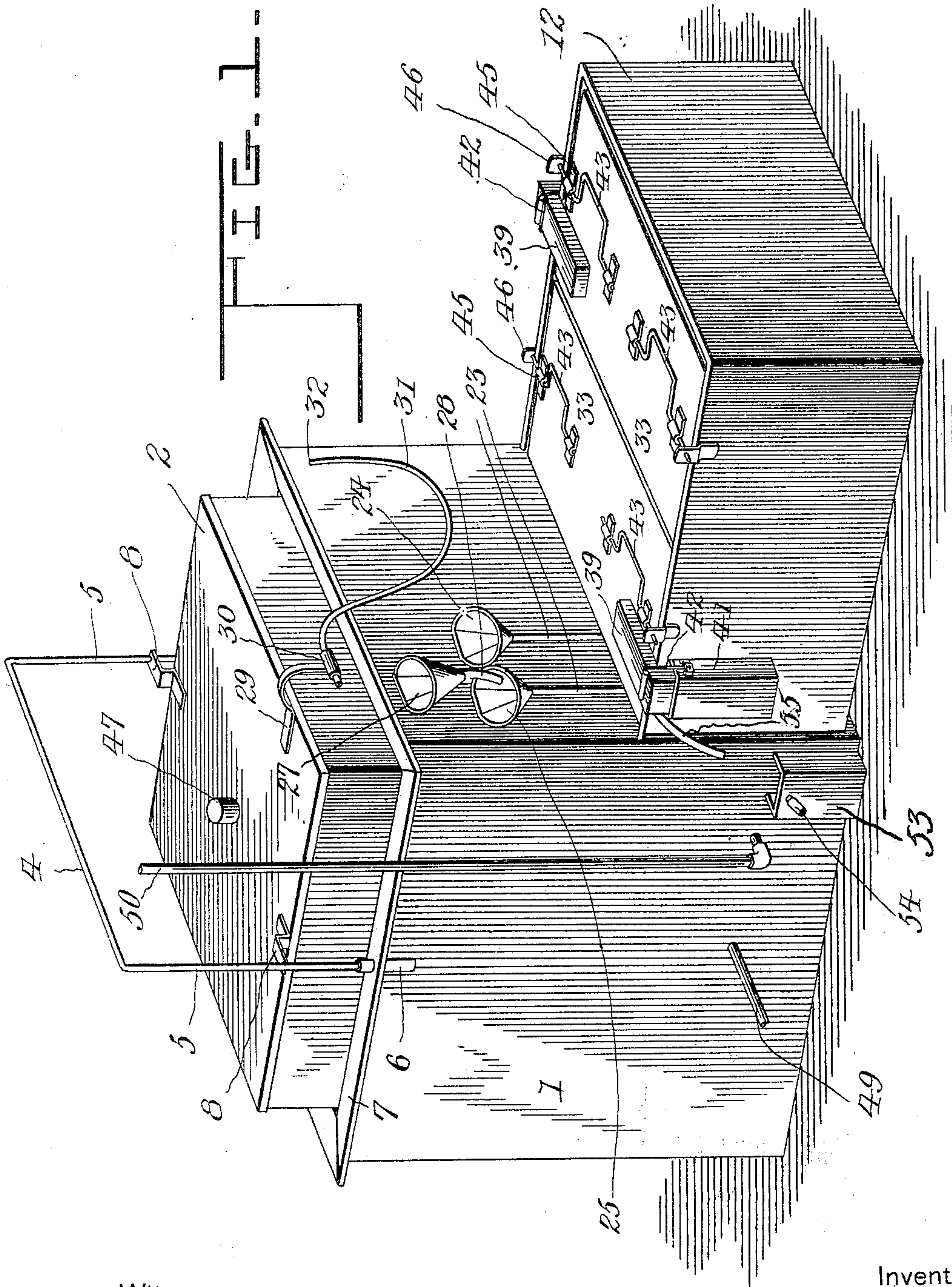
No. 804,215.

PATENTED NOV. 14, 1905.

G. H. CLIFF.
ACETYLENE GAS GENERATOR.

APPLICATION FILED OCT. 29, 1904.

5 SHEETS—SHEET 1.



Witnesses:

J. E. Page
H. O. Ammen

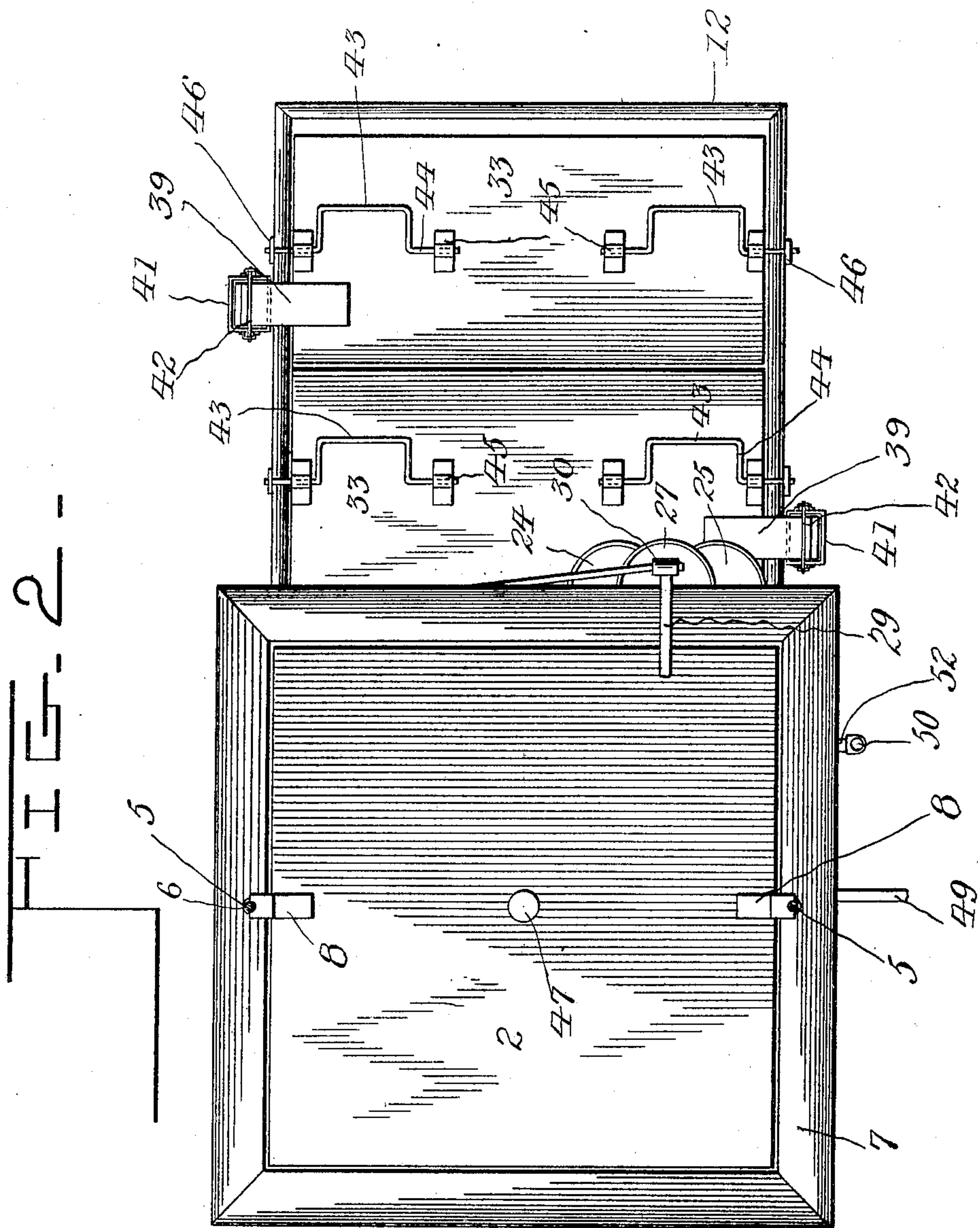
By

Inventor
George H. Cliff,
Marion Marion

Attorneys

G. H. CLIFF.
ACETYLENE GAS GENERATOR.
APPLICATION FILED OCT. 29, 1904.

5 SHEETS—SHEET 2.



Witnesses:

J. Ed. Page
F. D. Amman

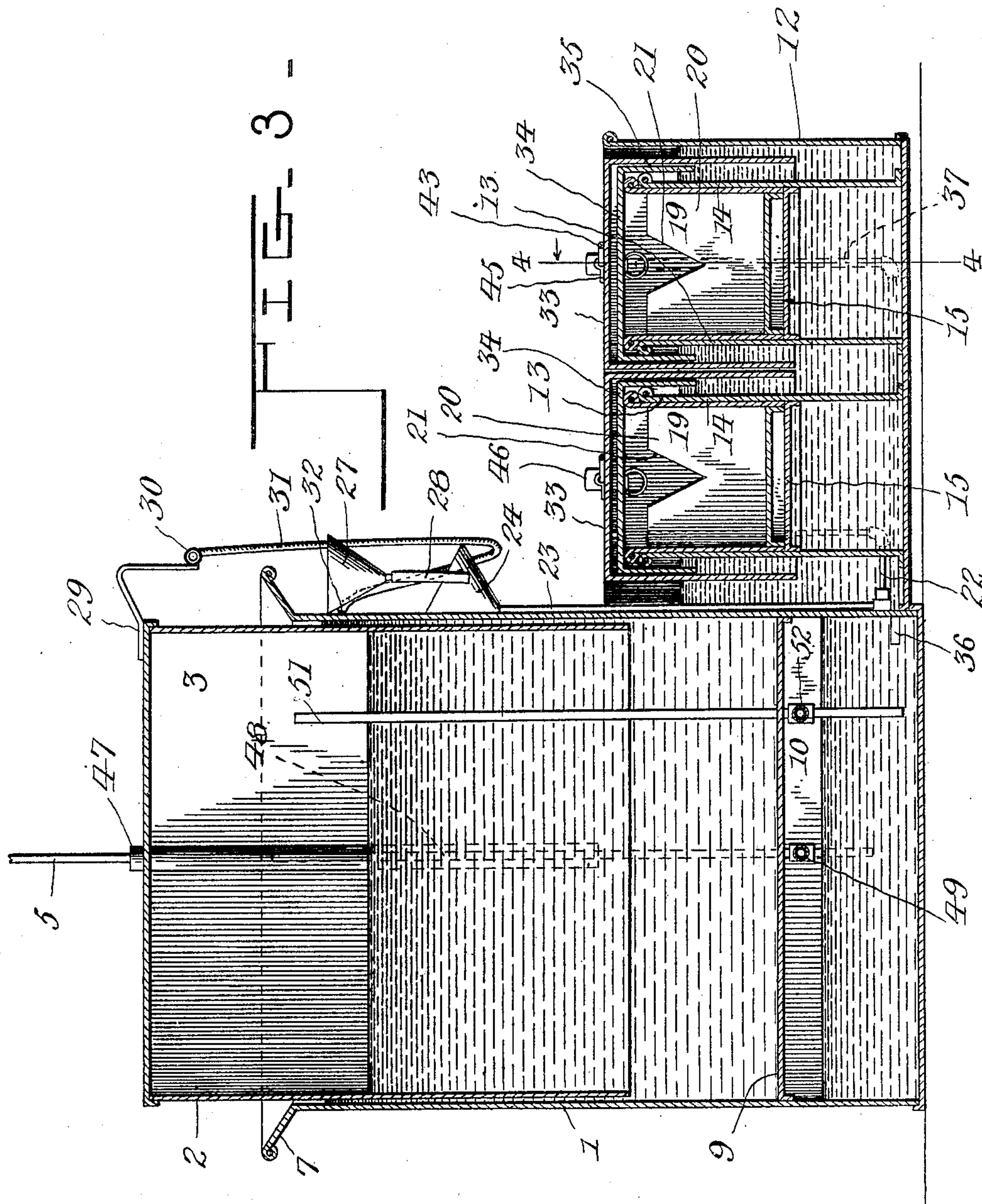
George H. Cliff, Inventor

By *Marion Marion*

Attorneys

G. H. CLIFF.
ACETYLENE GAS GENERATOR.
APPLICATION FILED OCT. 29, 1904.

5 SHEETS—SHEET 3.



Witnesses:

Ed. Page
J. D. Allen

George H. Cliff, Inventor

By *Marion Marion*

Attorneys

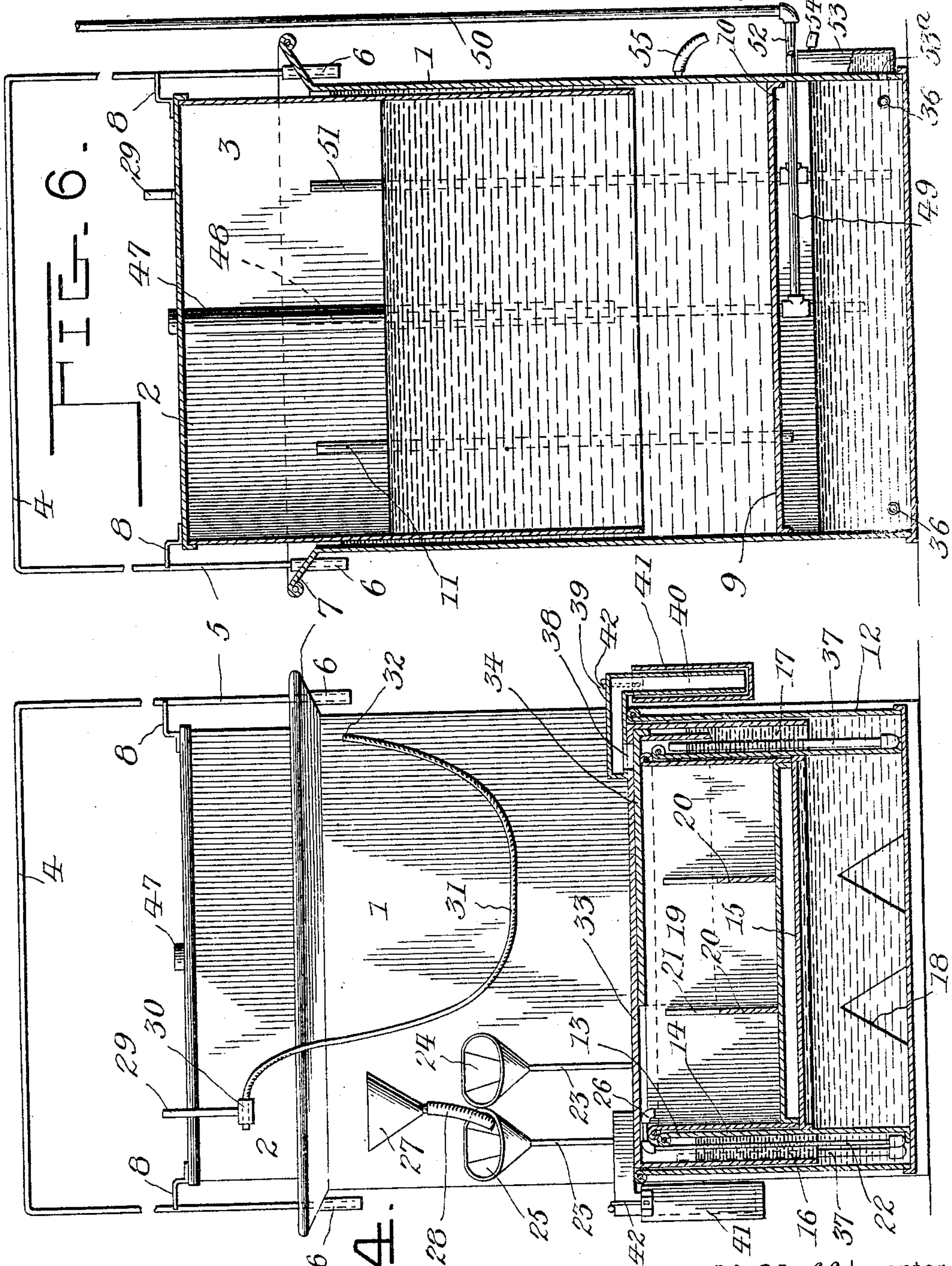
No. 804,215.

PATENTED NOV. 14, 1905.

G. H. CLIFF.
ACETYLENE GAS GENERATOR.

APPLICATION FILED OCT. 29, 1904.

5 SHEETS-SHEET 4.



Witnesses:

Ed. Page
J. D. Ammen

George H. Cliff, Inventor
By *Marion Marion*

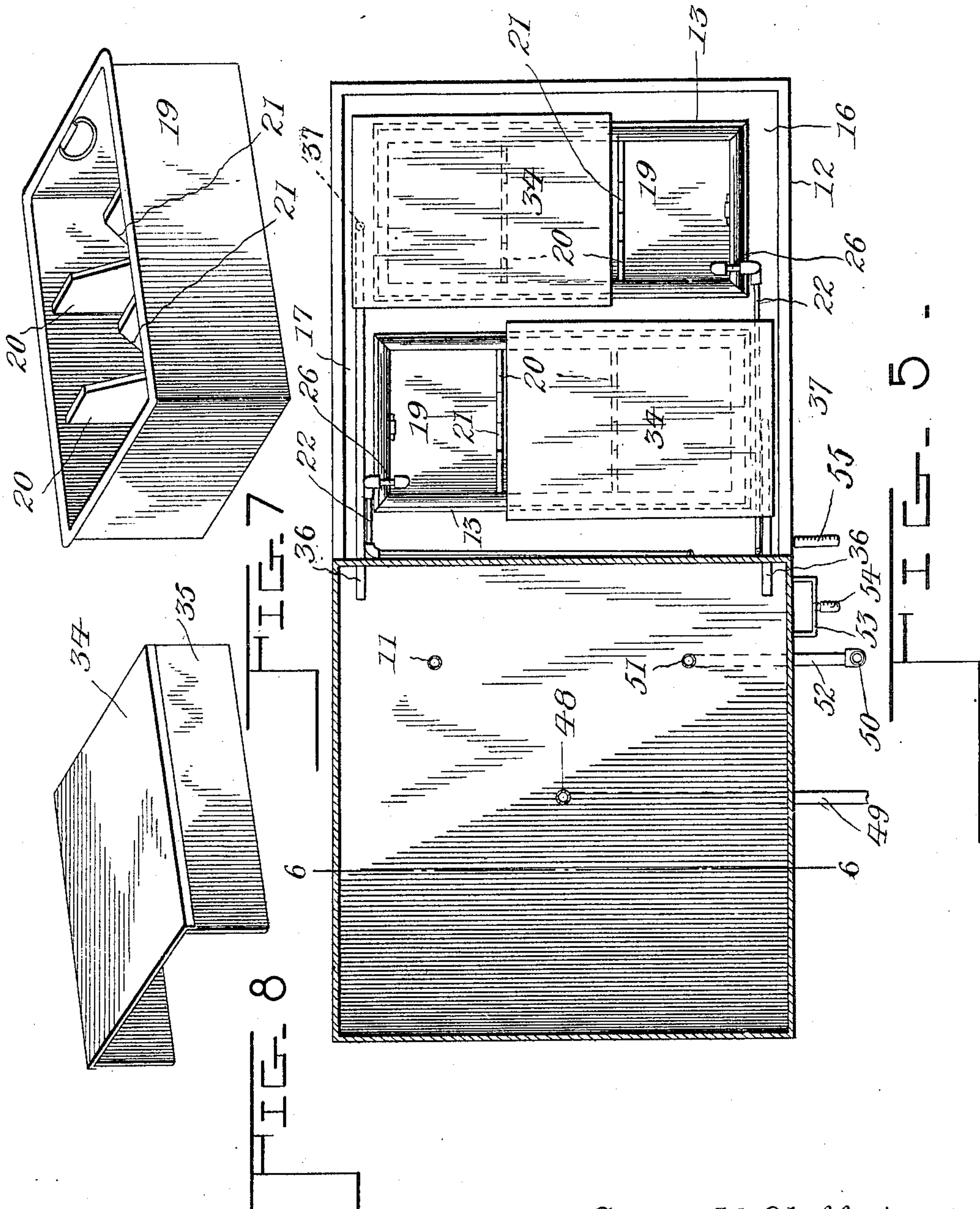
Attorneys

No. 804,215.

PATENTED NOV. 14, 1905.

G. H. CLIFF.
ACETYLENE GAS GENERATOR.
APPLICATION FILED OCT. 29, 1904.

5 SHEETS—SHEET 5.



Witnesses:

Jed Page
J. D. Amma

George H. Cliff, Inventor

By *Marion Marion*

Attorneys

UNITED STATES PATENT OFFICE.

GEORGE HENRY CLIFF, OF DUNDAS, CANADA, ASSIGNOR TO HARRY
GORDON CLIFF, OF DUNDAS, CANADA.

ACETYLENE-GAS GENERATOR.

No. 804,215.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed October 29, 1904. Serial No. 230,479.

To all whom it may concern:

Be it known that I, GEORGE HENRY CLIFF, a subject of the King of Great Britain, residing at Dundas, in the county of Wentworth, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Acetylene-Generators; and I do hereby declare that the following is 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 gas-producing apparatus, and especially to apparatus used in the generation and storing of acetylene gas. The object of the invention is to produce apparatus of the class described which is very simple in construction and not likely to get out of order, one of the aims being to dispense with stop-cocks, valves, taps, screw-plates, rubber gaskets, and so forth.

The invention contemplates an arrangement whereby all parts of the apparatus will be water-sealed, and simple arrangement is made for rendering the generation of the gas automatic and for preventing the overgeneration of gas.

The invention comprises also an improved construction of trap, together with improved means for relieving an excessive pressure.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

In the drawings, which fully illustrate my invention, Figure 1 is a perspective of the apparatus. Fig. 2 is a plan. Fig. 3 is a vertical section through the apparatus. Fig. 4 is a vertical section taken substantially on the line 4 4 of Fig. 3. Fig. 5 is a horizontal section taken through the upper portion of the apparatus, representing the generator-covers as removed. Fig. 6 is a vertical section taken substantially on the line 6 6 of Fig. 5. Fig. 7 is a perspective of one of the carbid-holders. Fig. 8 is a perspective of an auxiliary cover or lid used in connection with the carbid-holders.

Throughout the drawings and specification the same numerals of reference denote like parts.

Referring more particularly to the parts, 1 represents the body of the gas-holder, which, as shown, consists of a substantially rectangular vessel or tank preferably constructed of

sheet metal and containing a quantity of water. Within this tank there is received a bell 2, also of sheet metal, the lower edge whereof is immersed in the water in the usual manner, the said bell, in connection with the body 1, constituting a gasometer, it being understood that arrangement is made whereby the gas may accumulate in the space 3 under the bell. As usual, the bell is expected to rise and fall with the variations in the volume of gas in the space 3, for which purpose arrangement is made for guiding the upper portion of the bell. This arrangement consists in providing a guide-frame 4, having vertically-disposed side bars 5, which are stepped in sockets 6, carried at the expanded mouth 7 of the body 1, as shown. Guide-brackets 8, attached to the upper side of the bell, have notches or recesses which receive the vertical bars 5, as will be readily understood.

The body 1, which has a false bottom 9 and the space 10 beneath the same, is partially filled with water and constitutes a trap for reasons which will appear more fully hereinafter. The space 10 communicates with the space 3 under the bell by a pipe 11, which passes vertically up through the body 1, as indicated.

At the lower portion of the body and at the forward wall thereof there is attached a generator-tank 12, consisting, substantially, of an open rectangular vessel intended to be partially filled with water, as indicated. Within this tank 12 generator-boxes 13 are formed, the same being substantially of rectangular form, comprising vertical side walls 14 and elevated or false bottoms 15. The dimensions of these generator-boxes are such that spaces 16 and 17 are left in the generator-tank at the ends of the boxes at the bottom. The side walls of the boxes are preferably cut away or mutilated, as indicated at 18. Within the boxes 13 carbid-holders 19 are placed, the same consisting of rectangularly-formed trays with transverse walls 20 dividing the same into compartments, as indicated, the said walls being preferably mutilated by means of deep substantially V-shaped notches 21. There are preferably two of these boxes 13, each adapted to receive a carbid-holder, as indicated. Automatic arrangement is made for delivering water to the carbid-holders, for which purpose pipes 22 are placed as shown, the said pipes comprising vertical extensions

23, which terminate above in funnels 24 and 25. At the carbid-holders the said pipes 22 comprise goosenecks 26, which deliver the water over the edges of the carbid-holders 5 and at opposite ends of the same. Above the funnels 24 and 25 and preferably substantially centrally therebetween there is arranged a feeder or funnel 27, the same being attached to the wall of the body 1, as indicated, and communicating below with a drip-pipe 28, which latter pipe is preferably of rubber or similar material and adapted to have its mouth lie within either of the funnels 24 25. Substantially vertically above the 15 feeder 27 the bell 2 is provided with an arm 29, preferably overhanging the same, as shown, and the lower portion of this arm is formed into a substantially horizontal rest 30, which is adapted to receive the extremity of a feed-pipe or hose 31, the opposite extremity whereof passes to the wall of the holder at 32, just beneath the water-line within the body. From this arrangement it should be understood that 25 when the outer extremity of the hose 31 is maintained in an elevated position no water will flow therethrough; but when by reason of the exhaustion of the gas under the bell, the said bell descends sufficiently to bring the rest 30 beneath the water-line within the holder, 30 a small quantity of water will flow through the hose through the feeder 27, and find its way to the carbid-holders.

The gas generated in the carbid-holders is caught under the generator-covers 33, which 35 covers consist, substantially, of bottomless rectangular box-like bodies, the lower edges whereof are immersed in the water in the generator-tank, as indicated most clearly in Fig. 3. These generator-covers are of such dimensions that they substantially fill the entire 40 area of the generator-tank and include beneath them portions of the spaces 16 and 17 referred to above. It should be stated at this point that the pipes 22 pass upwardly through these 45 spaces, so that their upper portions lie under the generator-covers, as indicated most clearly in Fig. 4.

Over the carbid-holders are placed auxiliary covers or lids 34, the construction of which is 50 most clearly shown in Fig. 8. These lids have depending side walls or flanges 35 on three sides of the same, as shown. Their length is less than that of the holders, so that when they are applied to the holders, as indicated in Fig. 4, with their open sides disposed 55 toward the point where the goosenecks 26 are located, they constitute incomplete covers. In order to lead away the gas which is generated, pipes 36 are employed, the same being 60 disposed at opposite sides of the generator-tank and having vertical extensions 37, the mouths whereof are located above the water-line and under the auxiliary covers or lids 34, as shown most clearly in Fig. 4. These pipes 65 36 communicate with the space 10, which con-

stitutes a trap, the same entering the space beneath the water-line and near the bottom of the trap, as shown most clearly in Fig. 6.

From an inspection of Fig. 8 it will appear that the auxiliary covers or lids 34 are applied 70 in opposite positions—that is, the covers are applied to opposite ends of the carbid-holders to correspond with the arrangement of the pipes 36.

The generator-covers 33 are provided in 75 their upper walls with openings 38, which openings are in communication with pipes 39, having substantially vertically-disposed extensions 40, which project downwardly at the side of the generator-tank. These extensions 80 40 are normally received within buckets 41, which are partially filled with water for the purpose of forming a seal to prevent the escape of gas through the said pipes, the said buckets being provided with bails 42, supporting the same, as shown. It should be observed that the openings 38 are located so that they lie over the auxiliary covers 34 at a point remote from the open sides of the 90 said covers. Upon the upper sides of the generator-covers 33 bails 43 are attached, preferably two being used in connection with each cover. The said bails have shanks 44, which constitute axes of rotation for the said bails, and these are slidably mounted in clips 95 or straps 45, which are attached to the upper face of the covers, as indicated. These shanks 44 are substantially in alinement with ears 46, attached to the tank and having openings 100 therethrough which may receive the shanks, as indicated. From this arrangement it follows that when the shanks 44 are in engagement with the ears 46 the generator-covers would be maintained in a depressed position, so as to prevent their rising from the pres- 105 sure of the gas therebeneath.

The bell 2 is provided with a centrally-disposed blow-off tube 47, which is closed above, as usual, and which receives within the same 110 a blow-off pipe 48, which pipe extends vertically downward, so that its lower extremity dips in the water in the trap 10, above which point it connects with a horizontal extension 49, which leads out of the building in which the apparatus is supposed to be placed. A 115 service-pipe 50 is disposed at the side of the apparatus, the same connecting with a vertical extension 51 disposed within the holder, as shown, the said extension 51 extending below the horizontal connection 52 and dipping 120 in the water in the trap, as shown. It should be observed that the lower mouth of the extension 48 is disposed at a higher level than the lower mouth of the extension 51, from which arrangement the blow-off pipe will be 125 the first to be uncovered by a descent of the water-level in the trap.

At the side of the trap 10 a water-pocket 53 is attached, the same being in communication at 53^a near its lower extremity with the 130

interior of the trap and having an overflow 54 disposed at the level desired for the water within the trap. In connection with the generator-tank 12 an overflow-pipe 55 is arranged.

5 The mode of operation of the apparatus will now be described.

The exhaustion of the gas beneath the bell 2 will result in depressing the rest 30 to a point below the water-level within the body 10 1, so that water would flow through the feeder 27, eventually finding its way through either of the pipes 23 to either of the carbid-holders 19, passing through one of the goosenecks 26. The carbid would then react with this 15 water, and the gas generated would collect in the space under the auxiliary cover of the active carbid-holder. As the generation of the gas continued and the carbid became consumed the water would eventually penetrate 20 to the extremity of the carbid-holder remote from the point of admission of the water. The gas which would be generated in this remote portion of the carbid-holder, however, would be obliged to flow back toward the 25 partially-uncovered end of the carbid-holder and then forwardly around the sides and top of the auxiliary cover to find outlet through the vertical extension 37 of the corresponding pipe 36. The presence of the auxiliary 30 cover is considered highly advantageous in preventing an overgeneration of gas. Seemingly the overgeneration of gas is prevented by the fact that the moisture-laden gas just formed does not pass over the surface of the 35 unconsumed carbid, and in practice it has been found that the carbid in the remote portion of the carbid-holder remains unconsumed until reached by the percolation of the water entering from the side. The gas passes by 40 either of the pipes 36 to the trap 10, entering beneath the water-line within the same, as shown. While this trap operates to prevent the backflow of gas from the gasometer or holder, the water of the trap also operates to 45 cool the gas and reduce the relatively high temperature at which it comes from the generators. When the carbid of the active carbid-holder has become consumed, the pipe 28 will be disposed in the funnel 24, so as to 50 bring the other generator into operation. The carbid in the generator now thrown out of use would then be replenished. To do this, it would be necessary to remove the generator-cover above the inactive carbid-holder, 55 and in order to facilitate the removal of this cover the bucket 41 would be removed from the pipe 40, so as to open communication with the outer air to enable the cover to be raised without producing a partial vacuum 60 therebeneath. It should be understood, of course, that the bails 43 of this cover would be slid longitudinally inwardly to disengage the same. If during the operation of the apparatus the bell should refuse to respond, so 65 as to rise and accommodate accumulations of

gas, no harm can result from the rise in pressure under the bell which would necessarily follow. If, for instance, the bell should become fixed, the high pressure within the same would be communicated through the pipe 11 70 to the trap and would displace a quantity of water through the overflow of the trap, and if this state of affairs continued a sufficient length of time the water-level within the trap would become so depressed as to uncover the 75 lower mouth of the blow-off pipe 48. When this occurred, the pressure would relieve itself through the blow-off pipe 48. Evidently, also, the lower extremities of the pipes 48 and 51 operate as drips or outlets for water 80 which may condense in the pipes thereabove. Of course the blow-off tube 47 operates in the usual manner in connection with the blow-off pipe 48, it being understood that if 85 the bell should rise to such a height as to uncover the mouth of the tube 47 the excessive accumulation of gas would flow out through the blow-off pipe 48 in the manner which is usual in apparatus of this kind.

The apparatus described constitutes very 90 simple means for generating acetylene gas and has the advantage of economy of construction added to safety and efficiency in operation. It must be observed that all necessity for gas-tight joints is obviated by the 95 universal employment of water seals.

The arrangement for preventing the excessive generation of gas in the carbid-holders is considered a highly advantageous feature.

While I have shown in the accompanying 100 drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or 105 utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following claims or of mechanical equivalents to the 110 structures set forth.

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

1. In apparatus of the class described, in combination, a generator-tank constructed to 115 contain a bath, a generator-cover having a depending side wall dipping in said bath, means for generating gas under said cover, a downwardly-extending pipe communicating with the interior of said generator-cover, and 120 a removable water seal for said pipe.

2. In apparatus of the class described, in combination, a generator-tank constructed to contain a bath, a generator-cover having side 125 walls dipping therein, means for producing a gas under said cover, said cover having a downwardly-projecting pipe communicating with the interior thereof, and a bucket adapted to contain a liquid and receiving said pipe.

3. In apparatus of the class described, in 130

combination, a generator-tank constructed to contain a bath, a generator-cover dipping in said bath, slidable means for locking said generator-cover against rising, said generator-cover having an opening therein, and a removable water seal for said opening.

4. In apparatus of the class described, in combination, a generator-tank constructed to contain a bath, a generator-cover dipping in said bath, bails carried by said generator-cover for lifting the same, means of engagement between said bails and said tank to lock said generator-cover against rising, said generator-cover having an opening therein, and a removable seal for said opening.

5. In apparatus of the class described, in combination, a generator-tank constructed to contain a bath, a generator-cover dipping in said bath and having an opening therein, a removable water seal for said opening, bails carried by said cover and having shanks slidably attached to the upper side of said cover, and means carried by said tank for engaging said shanks to lock said cover against rising.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

GEORGE HENRY CLIFF.

Witnesses:

H. G. CLIFF,

LILLIE L. HOOD.