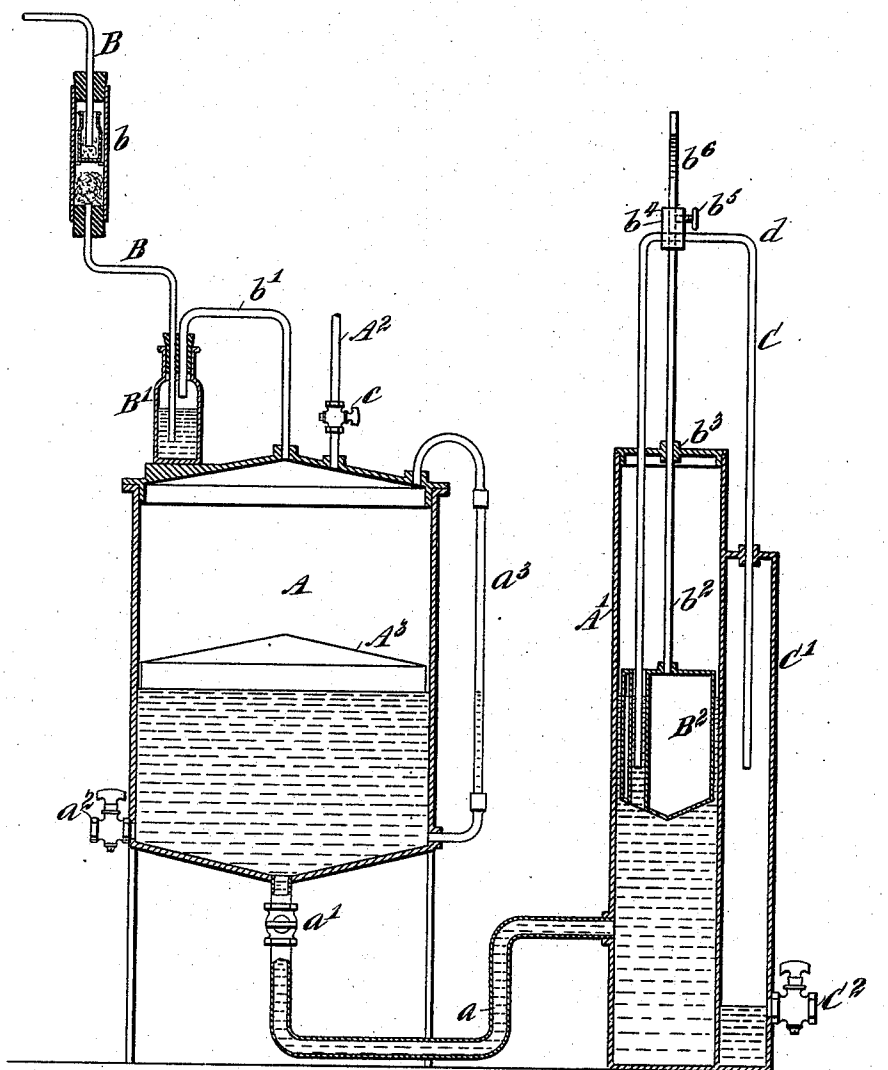


(No Model.)

F. G. WALLER.
APPARATUS FOR COLLECTING GASES.

No. 570,357.

Patented Oct. 27, 1896.



WITNESSES:

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FRANCOIS G. WALLER, OF DELFT, NETHERLANDS.

APPARATUS FOR COLLECTING GASES.

SPECIFICATION forming part of Letters Patent No. 570,357, dated October 27, 1896.

Application filed June 11, 1895. Serial No. 552,491. (No model.) Patented in Germany June 28, 1894, No. 80,832; in Belgium July 11, 1894, No. 110,937; in England January 16, 1895, No. 1,040, and in Austria August 4, 1895, No. 45/2,796.

To all whom it may concern:

Be it known that I, FRANCOIS GERARD WALLER, of Delft, Holland, have invented a new and Improved Apparatus for Collecting Gases, (for which I have obtained Letters Patent in Belgium, No. 110,937, dated July 11, 1894; in Austria, No. 45/2,796, dated August 4, 1895; in Germany, No. 80,832, dated June 28, 1894, and in England, No. 1,040, dated January 16, 1895,) of which the following is a full, clear, and exact description.

This invention relates to an apparatus for collecting gases or vapors for the purpose of subsequently making an analysis of a part of such gas or vapor.

I will describe an apparatus embodying my invention, and then point out the novel features in the appended claims.

In the accompanying drawing, forming a part of this specification, is shown in partial section and partial elevation an apparatus embodying the invention.

Referring to the drawing, A designates a closed receiving-tank, and A' is a siphon-tank which is shown as of smaller dimensions than the tank A. Communication is provided between the tanks by means of a pipe a, leading from the bottom of the tank A to the lower portion of the tank A'. The pipe a is provided with a stop-cock a' adjacent to its connection with the tank A. The tank A is provided with a liquid-inlet controlled by a valve a² near its lower end, and a vapor-exit pipe A², controlled by a valve c, leads from the upper end of the tank, and a liquid-gage a³ is connected with the tank. Fitting snugly, yet movably, within the tank A is a float A³, which serves in a great degree to prevent fluid in the tank from absorbing the carbonic acid of the gas or vapor.

B is a gas-inlet pipe designed to lead from a funnel, smoke-box, or other receptacle containing gases or vapors to be collected and examined. A soot-filter and draining apparatus b is arranged in the pipe B, and the end of said pipe B extends into the liquid contained in a liquid-sealed valve B', mounted on the tank A. From the interior of the valve B', above the liquid-level, a tube b' leads through the top of the tank A.

Within the tank A' is a float B², having a

stem b², movable through an opening in the top b³ of the tank A'. A block b⁴ is mounted to slide on the stem b², and, as here shown, it may be secured as adjusted on the stem by means of a set-screw b⁵. The stem b² is provided with gage-marks b⁶, by means of which the proper or desired adjustment of the block b⁴ may be determined.

C is a siphon having its transverse portion or bend attached to the block b⁴ and having one leg extended into the tank A' and through a vertical opening in the float B² and the other leg extended into a well C', provided at its lower end with an outlet controlled by a valve C². It will be seen from the construction described that the siphon is carried by the float B².

The operation is as follows: The siphon is so fixed with relation to the float that the velocity of discharge of the fluid has the desired value; that is to say, that in a certain period of time a certain quantity of fluid flows off and the desired volume of gas is drawn in. As the siphon descends with the float the velocity of discharge remains constant if the level of the fluid falls down. The tanks A A' are to be entirely filled with fluid, for instance, water, the valve a' opened, and the valves a² C² c closed. The gases or vapors to be gathered are now let through the pipes B b' into the tank A. The level of the fluid in the tank A descends with the level in the tank A', from which tank the liquid flows off through the siphon C. As the float A³ falls the gases or vapors are drawn into the tank A, and when said tank is filled with gases or vapors fluid under pressure is admitted to the tank through the valve a², the valve c is opened, and the valve a' closed, so that by the upward movement of the float A³ the gases or vapors will be forced through the pipe A² to an apparatus for making the analysis. The liquid-valve B' will prevent the return of gas or vapor to the pipe B.

The working of the apparatus may be stopped at any moment without the necessity of emptying the siphon. After having closed the outlet controlled by the valve C² the level of the fluid in the well C' rises until it has reached the height of the level in the tank A' and then the siphon C ceases to flow; but

upon opening the valve C² the apparatus is immediately set in operation. During the entrance and exit of the gases the level of the fluid may be observed by the gage a³.

5 It is obvious that the apparatus will work equally well when the pressure of the gases in the tank A is less or greater than the outer atmospheric pressure if the specific gravity is taken into account. By the application of
10 a large and small vessel also the advantage is attained that the variations in pressure in the space containing the gases, which are let to the larger vessel, have very little influence on the mean composition of the separated
15 sample.

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

20 1. In an apparatus for collecting gases, two communicating tanks, a float in one of the tanks, a siphon carried by said float, a float in the other tank, a gas-inlet pipe comprising a filter, and a gas-outlet, substantially as specified.

25 2. In an apparatus for collecting gases, a gas container or tank, a float therein, a siphon-tank having communication with the first-named tank, a float in the siphon-tank, a siphon carried by the float, and gas inlet and
30 outlet pipes communicating with the first-named tank, substantially as specified.

3. In an apparatus for collecting gases, a gas-tank, gas supply and discharge pipes con-

nected therewith, a liquid-inlet, a float in the gas-tank, and means comprising a siphon for
35 automatically controlling the flow of liquid from said tank, substantially as specified.

4. In an apparatus for collecting gases, two communicating tanks, a float in one of the tanks, a siphon carried by said float and hav-
40 ing one leg extended into a well provided with a valve-controlled outlet, a float in the other tank, a gas-inlet pipe comprising a liquid-sealed valve, and a gas-outlet, sub-
45 stantially as specified.

5. The combination with a gas and liquid tank, of a siphon-tank, a float therein and a siphon carried by the float and adjustable
45 relatively thereto, substantially as specified.

6. The combination with two tanks, sub-
50 stantially as shown and described, of a siphon in one of said tanks, a float carrying the siphon, a well into which one leg of the siphon extends and a valve-controlled outlet for the
55 well, by means of which the operation of the apparatus may be controlled, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 17th day of May, 60
1895.

F. G. WALLER.

Witnesses:

J. G. F. ROOKER,
T. D. HOUMANS.