Dec. 14, 1948. W. M. BUEHL ET AL 2,455,975

GAS GENERATOR

Filed June 28, 1944

2 Sheets-Sheet 1

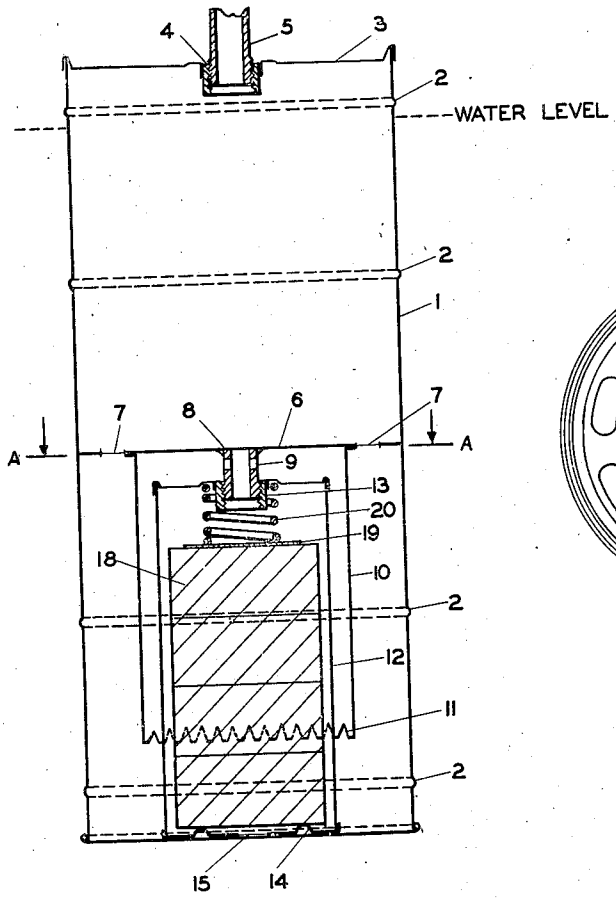


FIG. 1

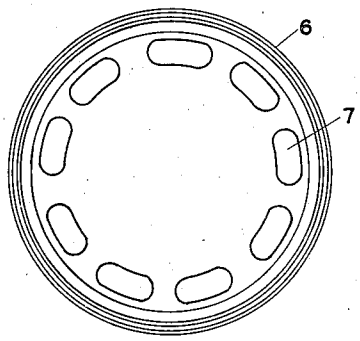


FIG. 3

INVENTORS.
WALTER M. BUEHL
CLARK B. SHEPHERD
BY Theodore J. Budrow

ATTORNEY

Dec. 14, 1948. W. M. BUEHL ET AL 2,455,975

GAS GENERATOR

Filed June 28, 1944 2 Sheets-Sheet 2

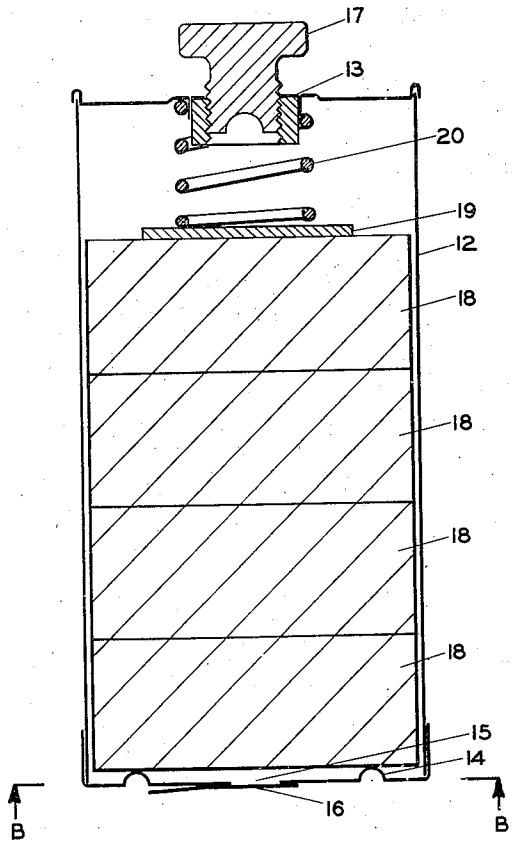


FIG. 2

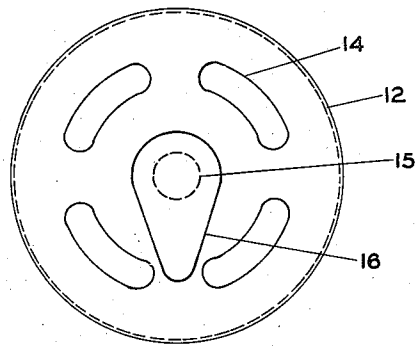


FIG. 4

INVENTORS.
WALTER M. BUEHL
CLARK B. SHEPHERD
BY Theodore T. Bushnow

ATTORNEY

Patented Dec. 14, 1948 2,455,975

UNITED STATES PATENT OFFICE

2,455,975

GAS GENERATOR

Walter M. Buehl and Clark B. Shepherd, Niagara Falls, N. Y., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware

Application June 28, 1944, Serial No. 542,582

2 Claims. (Cl. 23—282)

1

This invention relates to gas generators and, more particularly, to portable gas generators for the purpose of generating gas by the reaction of a solid chemical material with water.

An object of our invention is to provide an improved portable generator of the type which is operated by partially immersing the generator in a body of water so that water rises into the lower portion of the generator where it comes in contact with a solid gas generating material. A further object is to provide an improved gas generator of the type mentioned above having a replaceable container for the gas generating material. Another object is to provide means for washing and cooling the generated gas by contact with the water in which the generator is immersed. Another object is to provide a generator of this type which is of light weight and compact design. Still other objects will be apparent from the following description of our invention.

The appended drawings show one form of our invention. Figure 1 is a vertical section of the generator loaded with solid gas generating material. Figure 2 is a vertical section of the container 12 for the solid gas generating material loaded for shipment or storage prior to use. Figure 3 is a plan view at plane A—A of Figure 1. Figure 4 is a plan view at plane B of Figure 2, showing the bottom of the container 12.

With reference to Figure 1, the generator has a cylindrical gas collector 1, which is a sheet metal shell provided with peripheral reinforcing beads 2. Collector 1 is open at the bottom and provided with a cover 3 at the top. Threaded bushing 4 is provided in cover 3 and is adapted to receive the threaded gas outlet pipe 5. Inside collector 1 and at about the midpoint thereof is located a circular horizontal partition 6 which is fastened to the sidewalls of collector 1. Partition 6 is provided with a series of holes 7 near the periphery, as also shown in Figure 3, and with a pipe nipple 8 fastened to the lower side of the partition. Nipple 8 is provided with a series of holes 9. A cylindrical baffle 10 is fastened to and depends from partition 6, extending downward to a point a short distance above the bottom of collector 1. The bottom edge of baffle 10 is provided with serrations 11.

The cartridge or container 12 for the gas generating material, also illustrated by Figures 2 and 4, is a cylindrical can, the top of which is provided with a threaded bushing 13 adapted to screw on to the threaded nipple 8. The bottom of container 12 is a sheet metal disc provided with four raised beads 14, which are also shown in

2

Figure 4, and a hole 15 in the center. Figure 2 shows container 12 loaded and sealed for storage and shipment prior to use. Hole 15 is covered by a readily detachable sheet metal tear strip 16, also shown in Figure 4, which is soldered in place to form a hermetic seal. The opening at the top of the can is sealed by screw plug 17 which screws into the bushing 13. The solid gas generating material is in the form of cylindrical cakes 18 which rest upon the raised beads 14 and are smaller in diameter than the can so as to leave a free space around the cakes. The cakes 18 are held in position so as to prevent breakage during shipment by means of the retaining plate 19 which is pressed down against the cakes by spring 20.

To use the generator described above, plug 17 is removed from container 12, and the latter is screwed on to the threaded nipple 8, as shown in Figure 1. Tear strip 16 is then pulled off so as to open hole 15, and the entire apparatus then is immersed in water to a suitable depth, preferably to a short distance below the top of collector 1; for example, as shown by the legend "Water level" in Figure 1. The water passes through hole 15 and rises inside container 12 into contact with the gas generating material therein. The gas produced by the chemical reaction between the water and the gas generating material passes out through holes 9 and thence downwardly through the annular space between container 12 and the cylindrical baffle 10. Thence the gas passes out through the serrations around the bottom of baffle 10 and upwardly through the annular space between baffle 10 and the inside of collector 1 and thence out through the gas outlet pipe 5. The water level inside the generator will be even with, or somewhat lower than, the water level on the outside, depending upon the back pressure in pipe 5. In most uses of the generator the water level inside the generator for the most part will be above partition 6. Thus the gas passing from the bottom of baffle 10 rises through water on its travel to pipe 5 and thereby is thoroughly washed and cooled by the water. The water on the outside of the generator also aids in cooling the gas by reason of the rapid heat transfer through the sidewalls of collector 1 between the inside water and the outside water.

Our invention is not restricted to the particular form illustrated by the drawings and described above. Various changes in the construction thereof may be made by those skilled in the art without departure from the spirit and scope of the invention. For example, while we have il-

lustrated the invention as being constructed of relatively thin sheet metal, which is the preferred form, other modes of construction which will be apparent to the skilled engineer may be utilized. Likewise, various conventional means for detachably fastening container 12 to the interior of baffle 10 may be used in place of the particular device shown in the drawings. If desired, other gas outlet openings, with suitable closures therefor, may be provided in the upper portion of container 12, in place of, or in addition to, the opening provided by bushing 13. The serrations around the bottom of baffle 10 are not essential, but are preferred for better distribution of gas around the baffle.

The generator is generally useful for generating gas from any solid material which reacts with water or other liquid to produce a gas. It was designed especially to generate hydrogen by reacting sodium hydride with water and is excellently adapted to that purpose. While it is preferred for convenience to pack the container with one or more cakes of solid gas generating material, various other forms of the gas generating material may be used with good results; for example, granules, pellets, or the like.

We claim:

1. A portable gas generator of the type adapted to generate gas by chemical reaction between water and a solid gas generating material when the generator is partly immersed in water, which comprises a gas collector which is essentially a hollow shell open at the bottom and having an opening to serve as a gas outlet at the top, a cylindrical baffle which is a cylindrical hollow shell closed at the top and open at the bottom mounted inside said shell in the lower portion thereof, the bottom edge of said baffle being located a short distance above the bottom edge of said shell, the bottom edge of said baffle being serrated, the portion of said shell above said baffle forming a chamber which is connected by passageways with said lower portion, and a cylindrical container for gas generating material provided with fastening means for detachably mounting it inside and concentric with said cylindrical baffle and spaced from the top and sidewall thereof, the bottom of said container being substantially flush with the bottom of said shell, an opening in the bottom of said container provided with a readily detachable closure and an opening in the top of said container likewise adapted to be provided with readily detachable closure means for use when the container is disassembled from the baffle.

2. A portable gas generator comprising a container for gas generating material, said container having openings in its lower and upper portions, an enveloping gas baffle which is open at the bottom and closed at the top and which partially envelops said container when the latter is fixed therein so as to form a passageway leading downwardly from an opening in the top of said container through a space between the outside of said container and the inside of said baffle, fastening means for detachably fixing said container within said baffle, a hollow shell serving as gas collector fastened to said baffle so as to completely envelop and extend above and below said baffle, said shell having openings located both above the top of said baffle and below the bottom thereof.

WALTER M. BUEHL,
CLARK B. SHEPHERD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
705,570	Foldkamp	July 29, 1902
726,139	Busch	Apr. 21, 1903
834,831	Margreth	Oct. 30, 1906
1,016,681	Fallot	Feb. 6, 1912
1,049,034	Armstrong	Dec. 31, 1912
1,684,979	Valantour	Sept. 18, 1928
2,211,430	Ness	Aug. 13, 1940
2,334,211	Miller	Nov. 16, 1943