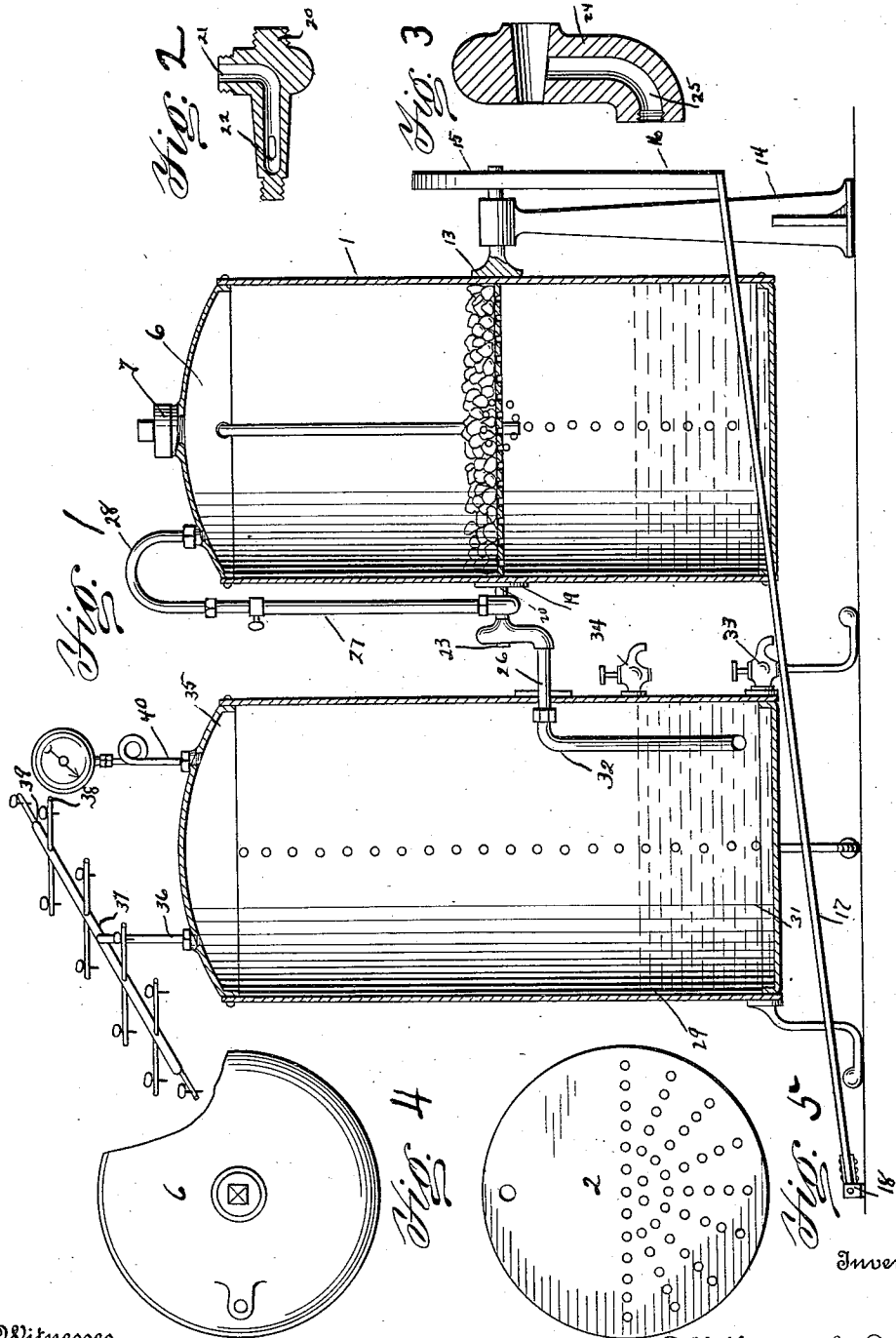


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HYDROGEN GAS GENERATOR.
APPLICATION FILED APR. 16, 1909.

1,015,875.

Patented Jan. 30, 1912.



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HYDROGEN-GAS GENERATOR.

1,015,875.

Specification of Letters Patent.

Patented Jan. 30, 1912.

Application filed April 16, 1909. Serial No. 490,274.

To all whom it may concern:

Be it known that I, WILLIAM LEONARD DOLBEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hydrogen-Gas Generators, of which the following is a specification.

This invention relates to improvements in gas generating apparatus and is particularly designed to provide a simple device for generating hydrogen gas for the inflation of toy balloons adapted for general commercial use.

One of the objects of the invention is the production of means for generating hydrogen gas adapted to be readily operated for the inflation of toy balloons.

Another object of the invention is the production of a device for the generation of hydrogen gas for the inflation of toy rubber balloons adapted to be operated without the aid of heat, and capable of being manufactured and operated at a small cost.

With the above and other objects in view this invention embraces certain combinations, constructions and arrangements of parts clearly described in the following specification and illustrated in the accompanying drawings, in which,

Figure 1 is a central vertical section of my improved gas generator apparatus. Fig. 2 is a detail sectional view of a valve part, Fig. 3 is a similar view of a valve part, Fig. 4 is a plan view of a generator top, Fig. 5 is a detail plan view of a perforated partition.

Referring to the accompanying drawings, which are prepared for illustration purposes and are accordingly not drawn to scale, numeral 1 denotes a generator tank having an inner partition plate formed with a plurality of perforations 3 located on one side or half thereof, and centrally mounted on the inner periphery of said tank so as to divide the tank into an upper chamber 4 for the reception of gas producing material such as zinc, and into a lower compartment 5 for the reception of a decomposing chemical body such as sulfuric acid. The tank 1 is provided with a closure top 6 which is formed with a central opening normally closed by a screw plug 7, and with a side opening through which a pipe 8 having a screw cap 9 extends into the chamber 5

through an opening formed in the partition plate 2.

On one side of the tank 1 a shaft 13 is mounted and a standard 14 having a bearing on its upper end supports said shaft, which carries on its outer end a wheel 15 over which is passed an operating belt 16 connected with an operating board 17, pivotally supported by a block 18 on its opposite end.

On the side of the tank 1 opposite to the side where the shaft 13 is mounted, is a plate 19 forming a bearing for a valve plug 20, which is formed with a right angular bore 21, having a lateral port 22 communicating therewith. One end of the valve plug 20 is formed with a taper and threaded for the reception of a lock nut 23 adapted to hold the same in position on a valve casing 24, which casing is provided with a bore 25 having a curved lower end and a T-shape upper end for the accommodation of the valve plug 20. The main passage of the bore 25 registers with the lateral port 22 of the plug 20, and the lower end of said passage communicates with a pipe 26 on which it is threaded. The upper end of the port 21 of the plug 20 communicates with a conducting pipe 27 having connection with an inverted U-shaped pipe 28 extending through the top 6 of the tank 1 and into the chamber 4. The pipe 26 connects with a purifying tank 29, which tank is suitably supported on legs 30. The tank 29 is provided on its bottom portion with a supply of water or gas filtering liquid 31 and the pipe 26 connects with an inner pipe 32 which normally projects into the water or liquid supply 31. A valve 33 is located on the lower or bottom portion of the tank 29 and communicates with the water supply 31, being provided to drain said supply from the tank 29 when so desired. A second valve 34 is located on the tank 29 slightly above the first valve 33 for holding the water supply 31 at a fixed level. The upper end of the tank 29 is provided with a cover or top 35 which carries a pipe 36 having a transverse discharge pipe 37 provided with a series of minor discharge pipes 38 each of which carries a controlling valve 39. A pressure indicator 40 is mounted on the top 35 for indicating the pressure of the gas accumulated in the tank 29.

Normally the tank 1 occupies a vertical

position with the gas producing material or zinc of the upper chamber 4 held out of contact with the decomposing acid or liquid of the lower chamber 5, by the perforated partition 2. When it is desired to generate a given amount of gas the tank 1 is rotated upon the shaft 13 and the valve casing 24, suitably supported by a leg 14, by applying foot pressure to the operating board or bar 17, which in turn causes the wheel 15 to be moved by the belt 16, so that the acid or decomposing chemical in the lower chamber of the tank 1 is brought into active contact with the decomposable or gas producing material or zinc in the upper chamber, by reason of the perforations in the partition plate 2. As the acid or decomposing chemical acts on the zinc, hydrogen will be generated and pass upward into the upper chamber 4 and through the U-shaped pipe, the pipe 27, the valve plug 20 by the bore 21 and the lateral port 22, and into the main passage of the bore 25 of the casing 24, through the pipes 26 and 32 into the tank 29, after being filtered and coiled by the water supply 31. When the upper part of the tank 29 is filled with hydrogen gas small toy balloons may be mounted on the ends of minor discharge tubes or pipes 38 and the valves 39 opened so that said balloons will be inflated with said gas; the rapidity of the inflation depending entirely on the pressure of the gas in the tank 29. When pressure is released from the foot plank or bar 17 the tank will automatically return to its normal position by force of gravity.

In order to discharge the used up zinc from the upper chamber of the generator the same is brought to the position shown in Fig. 8 and the discharge pipe opened so that the sulfate of zinc formed in the generation of gas will pass outwardly of the tank.

My improved gas generating device provides means for rapidly generating a given amount of gas and means for utilizing said gas for the rapid inflation of toy balloons.

It is obvious that the generator tank may be manufactured out of any suitable acid proof material, such as wood, glass porcelain, copper and aluminum.

Having described my invention I desire to secure by Letters Patent:—

1. In a gas generating apparatus for the

inflation of toy balloons, a gas accumulating tank having a supply of water therein, a plurality of spaced valves connected with the accumulating tank, a pressure indicator located on said tank, a series of balloon receiving discharge pipes connected with said tank, series of controlling valves located on said pipes, a conducting pipe communicating with the accumulating tank extending outwardly of the tank, a valve casing connecting with said conducting pipe, a rotary valve movable in said casing, a conducting pipe connected with said valve, a tank connected with said conducting pipe, means for connecting the second tank to the valve casing, a perforated partition for dividing the second tank into two chambers, a supply of decomposable material disposed in one of the chambers, a supply of decomposing material disposed in the second chamber, a shaft mounted on the outer side of the tank last mentioned, a standard for supporting the shaft, a wheel mounted on the shaft, a belt movable over the wheel for rotating the same, a foot operated plank connected with the belt, and a block for pivotally supporting the plank.

2. In a hydrogen gas generator consisting of a gas generating tank, and a gas cooling and purifying tank, an automatically controlled valve connecting said tanks, said generating tank being pivotally mounted on one side by means of a shaft secured thereto, and a bearing for said shaft, and on the other side by means of said valve, a pulley on said shaft and a means secured to said pulley for oscillating said generating tank.

3. In a hydrogen gas generator consisting of a gas generating tank, and a gas cooling and purifying tank a divisional plate being perforated on one half of its surface dividing said generating tank into two compartments, an automatically controlled valve connecting said tanks, and means for passing gas from the generating tank through a purifying medium contained in said purifying tank.

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

WILLIAM LEONARD DOLBEN.

Witnesses:

ALBERT HOFFMAN,
LYDA DOLBEN.