

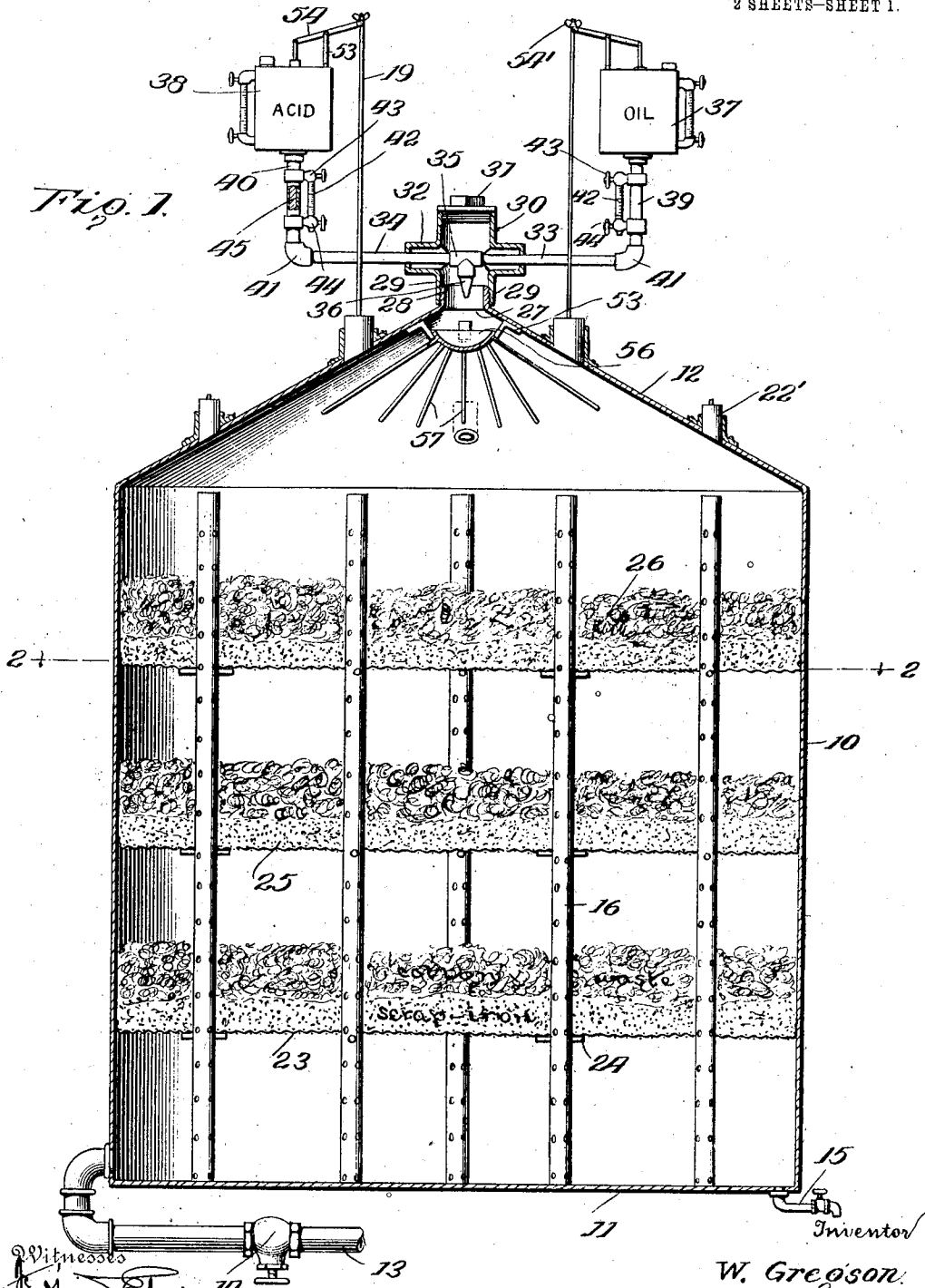
W. GREGSON.
GAS GENERATOR.

APPLICATION FILED SEPT. 3, 1912.

1,061,936.

Patented May 13, 1913.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

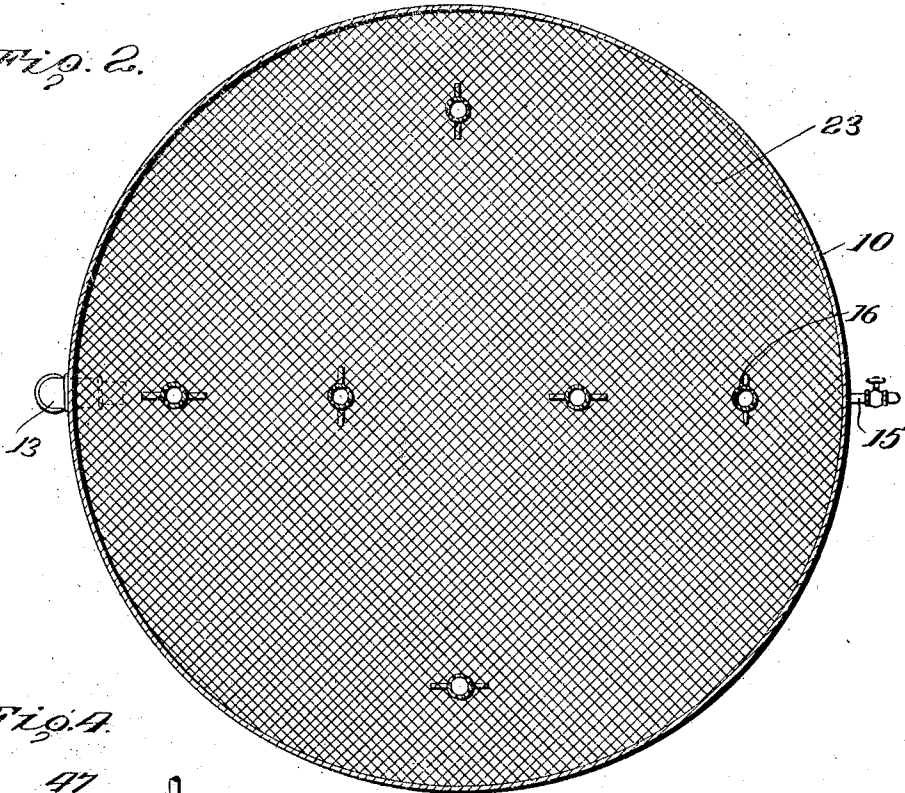


Fig. 4.

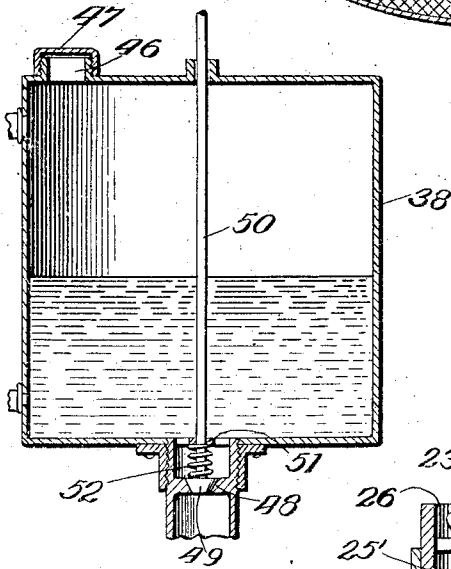


Fig. 3.

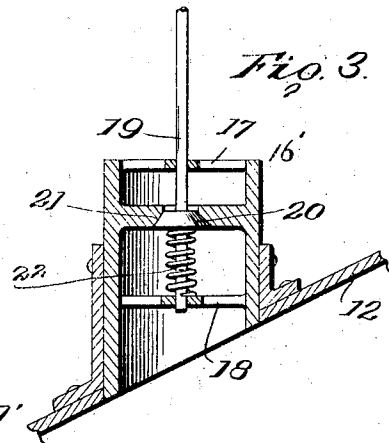
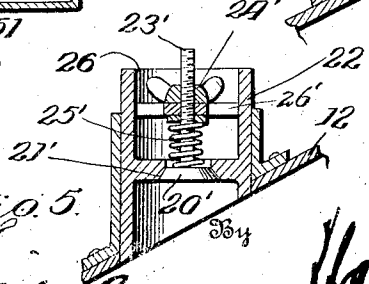


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM GREGSON, OF FORT WORTH, TEXAS, ASSIGNOR OF ONE-HALF TO JOHN A. WISHERD, OF STANTON, NEBRASKA.

GAS-GENERATOR.

1,061,936.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed September 3, 1912. Serial No. 718,358.

To all whom it may concern:

Be it known that I, WILLIAM GREGSON, citizen of the United States, residing at Fort Worth, in the county of Tarrant and State of Texas, have invented certain new and useful Improvements in Gas-Generators, of which the following is a specification.

My invention relates to new and useful improvements in gas generators and more particularly to generators of the type including a generator casing having air inlets and a gas outlet and in which are placed alternate layers of iron scraps or shavings and cotton waste, the gas being generated by the action of any suitable hydrocarbon oil and acid upon the waste and iron, and the object of my invention is to provide a novel form of automatic feed for supplying the necessary air, oil and acid to the generator in proper proportions.

A further object of my invention is to provide means for properly distributing the mixture of oil and acid supplied to the various parts of the generator.

A further object of my invention is to provide for a uniform distribution of the air through all parts of the generator at the same time. And a still further object of my invention is to provide for a relative free circulation of the gases through the various compartments or chambers of the generator and to the outlet.

With these and other objects in view, my invention will be more fully described, illustrated in the accompanying drawings, and then specifically pointed out in the claims which are attached to and form part of this application.

In the drawings: Figure 1 is a vertical central section of my improved generator, showing the interior construction of the same; Fig. 2 is a horizontal section on the line 2—2 of Fig. 1; Fig. 3 is a fragmentary sectional view, showing one of the air inlet valves; Fig. 4 is a detail sectional view of one of the supply tanks and the valve controlling its feed; Fig. 5 is a detail section of a supplemental air inlet valve.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The preferred embodiment of my invention includes a casing 10 which is prefer-

ably cylindrical in shape and provided with a bottom 11 and an upwardly directed, conical top 12. This casing is preferably formed of metal and interiorly enameled or otherwise coated to protect it from the action of the acids and gases employed. Leading from the bottom or any other suitable portion of the casing, is a gas outlet pipe 13 having a cut off valve 14 and leading from the side of the casing and adjacent its bottom, is a drain cock 15.

Extending vertically within the casing and in spaced relation, preferably concentrically of the casing, are a plurality of perforated stand pipes 16, the lower ends of which rest upon the bottom of the casing and the upper ends of which are disposed somewhat below the top 12 thereof. In the top are secured short vertical tubes 16' containing spaced spiders 17 and 18 through which is reciprocally mounted a valve stem 19 carrying a valve 20 which is normally held in engagement with a valve seat 21, formed in the tube by means of a coiled spring 22 which bears between the lowermost of the spiders and the valve.

The casing is divided interiorly into a plurality of superposed chambers by means of horizontal partitions 23 formed of foraminous material, preferably relatively heavy wire netting, the partitions being supported in place in the manner shown in Figs. 1 and 2 of the drawings by means of pins 24 which are passed through aligned perforations in the stand pipes and upon which the partition walls rest. Each of these partition walls forms the bottom of a chamber and said bottoms are covered with a coating of scrap iron or iron shavings 25 which is in turn covered by a layer of cotton waste 26.

The top 12 of the casing is provided with a central opening 27 about which is formed an upwardly directed, externally threaded annular flange 28 adapted to receive the internally threaded flange 29 of a cross coupling 30. The opposite arm of this cross coupling is normally closed by a turn plug 31. Extending into the horizontal arms 32 of this coupling, are pipes 33 and 34, the inner ends of which are connected by a T-coupling 35 having a discharge drip nozzle 36 which extends centrally of the opening 27.

An oil holding tank 37 and an acid holding tank 38 are mounted upon the upper ends of pipes 39 and 40, the lower ends of

which are connected to the pipes 33 and 34, respectively, by elbows 41. Each of these pipes is provided with a sight glass 42 having a cut off valve 43 and a drain cock 44 and the oil or acid, as the case may be, is caused to pass through these sight glasses by filling that portion of the pipe 39 or 40 between the upper and lower ends of the sight glass with lead or other suitable matter as shown at 45 to prevent the passage of the liquids through said pipes.

Each of the tanks 37 and 38 is provided with a filling opening 46 having a screw closure 47. Each of the pipes 39 and 40 is provided adjacent its upper end with a valve seat 48 in which is seated a valve 49 having a valve stem 50 which extends upwardly through a spider 51 formed in the upper end of the pipe and through the top of the tank, as shown. These valves are normally held in lowered or closed position by means of coiled springs 52 which surround the valve stems and bear between the valves and the spiders 51.

An arm 53 extends upwardly from the top of each of the tanks and fulcrumed intermediate their length upon the upper ends of these arms are levers 54, one end of each of which is operatively connected to the valve stems 50. The valve stems 19 are extended as shown in Fig. 1, and operatively connected to the free ends of the levers; thumb screws 54' being provided at the points of connection to regulate the throw of the levers. It will therefore be seen that upon drawing gas out of the generator, the partial vacuum formed therein will cause the valves 20 to open and admit air and the opening of certain of these valves will act through their valve stems 19 to open the valves 49 and admit a corresponding supply of oil and acid, the amount of which may be governed by the manually operated cut off valve 43, the flow of oil and acid being gaged by the sight glasses 42.

The air inlet valves 20 may sometimes fail to admit sufficient air. To meet this condition, I provide supplemental air inlet valves 20', shown in detail in Fig. 5, which fit against valve seats 21', formed within short tubes 22', secured in the top 12. The stem 23' of each of said valves is threaded and a thumb nut 24' is mounted on said stem to bear upon a spider 26' and hold the valve normally locked to its seat while a spring 25' is coiled around the stem between the valve and the spider and tends to move the valve from its seat. If the nut be loosened, the spring will expand and move the valve from its seat and thereby admit additional air.

Secured to the inner face of the top 12 and in spaced relation about the opening 27, are L-shaped brackets 53 which support a drip pan 56 in position to receive the mixed oil and acid as they pass from the nozzle 36.

Secured to the lip of this pan in spaced relation and extending radially therefrom, are a plurality of relatively heavy drip wires 57 and it will be apparent that as the oil and acid accumulate in the pan 56, they run over the lip of the pan and along these wires dropping off from the wires upon the cotton waste below. By this means, a comparatively uniform distribution of the oil and acid is obtained. This is a very important point in the construction of my generator as it is impossible to obtain a spray feed with the small quantity of liquid supplied.

In operation, the tank 38 is filled with any suitable acid, such as vinegar and the tank 37 with any suitable gas oil. The valves 43 are then adjusted to give the proper supply of acid and oil to the generator. The acid and oil pass through the pipes 34 and 33 respectively, and nozzle 36 and so to the pan 56 from which they pass along the wires 57 and drop to the cotton waste 26 in the uppermost of the chambers. The gas, formed in the generator can pass freely through all parts thereof by the stand pipes 16 and also through the foraminous partition walls 23 and said gas is drawn off from the generator through the pipe 13 in any suitable manner. As the generated gas is drawn off, the valves 20 in the stand pipes open automatically to permit the entrance of a fresh supply of air which, passing through the stand pipes, is distributed uniformly throughout the generator. The opening of these valves also serves to open the valves 49 and admit a proportional amount of acid and oil. The generation of the gas is therefore automatic and the gas obtained, providing the valves 43 are suitably adjusted, is uniform in quality.

From the foregoing description, it will be apparent that I have provided an improved form of generator which appears to be far superior to those now in use, due to the provision of the automatic controlling of the acid and oil valves by the air intake valves, the uniform distribution of the mixed oil and acid over the topmost layer of cotton waste, and the free circulation of the supplied air and of the generated gases through the entire generator as permitted by the perforated stand pipes and the foraminous partition walls. The stand pipes and partition walls are preferably enameled or otherwise coated to protect them from the action of the acid, but this is not essential as the action upon them will be relatively slight and they may be readily replaced when necessary.

It will of course be understood that I do not wish in any way to limit myself to the specific details of construction set forth in the above specification as any modifications within the scope of the appended claims may be made, without in the slightest degree departing from the spirit of my invention.

I claim:

1. A gas generator including a casing, a gas outlet pipe leading from the casing, air supply pipes leading into the casing, automatic valves in said pipes governing the supply of air to the casing, an oil pipe leading to the casing, a valve in said pipe, means operatively connecting one of the air controlling valves with said pipe valve to open the latter upon the opening of the air valve, an acid supply pipe leading into the casing, a valve in said acid supply pipe, and means coacting with another of the air controlling valves and the valve in the acid supply pipe to open the latter upon the opening of the air valve.

2. A gas generator including a casing, a gas outlet pipe leading from the casing, air supply pipes leading into the casing, valves in said pipes for automatically governing the supply of air to the casing, oil and acid pipes leading to the casing, means operable by the valves of the air supply pipes for automatically governing the passage of oil and acid to the casing, said means including valves controlling the flow of oil and acid through their respective pipes, valve stems for said valves, levers fulcrumed intermediate their length and operatively connected with the free ends of said valve stems, and valve stems connecting certain of the air inlet valves with the free ends of said levers.

3. A gas generator including a casing, a pipe leading from the casing, means for supplying air to the casing, a T-coupling having a discharge nozzle extending into the casing, pipes leading from said coupling and communicating with acid and

oil holding tanks, sight glasses carried by said pipes, valves for regulating the flow of oil and acids through said sight glasses, and means including automatic air inlet valves for controlling the movement of said regulating valves.

4. A gas generator including a casing, an outlet pipe leading from the casing, means for supplying a mixture of oil and acid to the casing, a plurality of vertically extending perforated stand pipes positioned in spaced relation within the casing, and means for admitting air to the casing.

5. A gas generator including a casing, means for supplying oil and acid to the casing, means for supplying air to the casing, a plurality of transversely extending partition walls dividing the casing into chambers, said partition walls being formed of foraminous material and the perforated stand pipes extending vertically of the casing and through said partition walls.

6. A gas generator including a casing, a plurality of perforated stand pipes extended vertically of the casing, a plurality of transversely extending foraminous partition walls positioned within the casing, pins passed through perforations of the stand pipes and supporting said partition walls, means for supplying a mixture of acid and oil to said casing and through its upper end and means for supplying air to the casing.

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

WILLIAM GREGSON. [L. s.]

Witnesses:

FRED ROPKE,
JAS. WILSON.