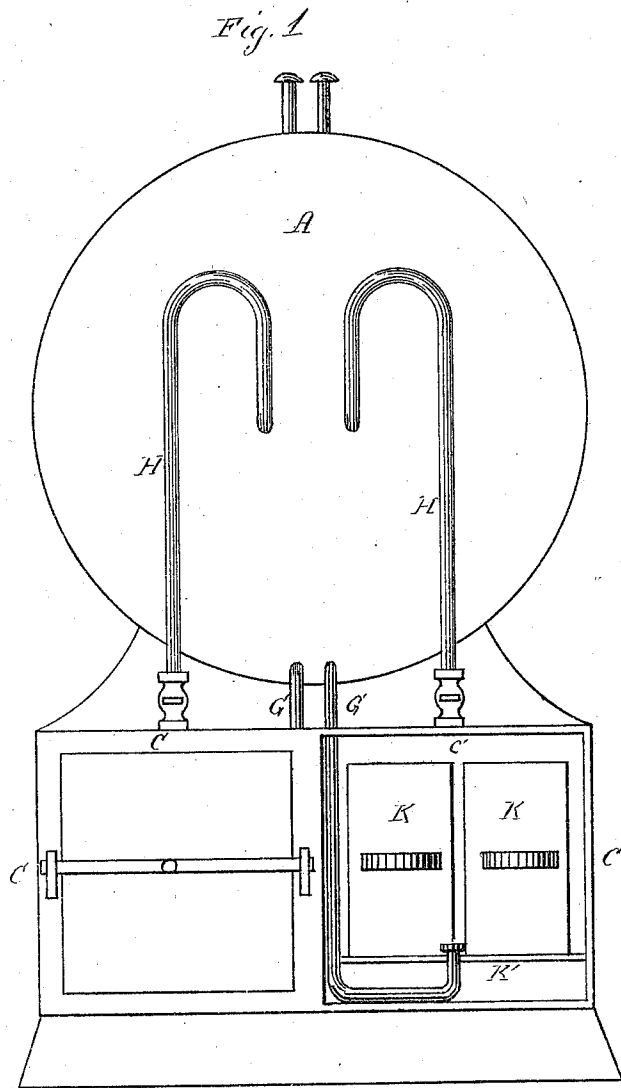


JOHN H. STEINER.

Improvement in Gas-Generators and Carbureters.

No. 126,652.

Patented May 14, 1872.



Witnesses
J. L. Coombs
J. J. Coombs

Inventor
John H. Steiner
by *C. L. Coombs*
att'y.

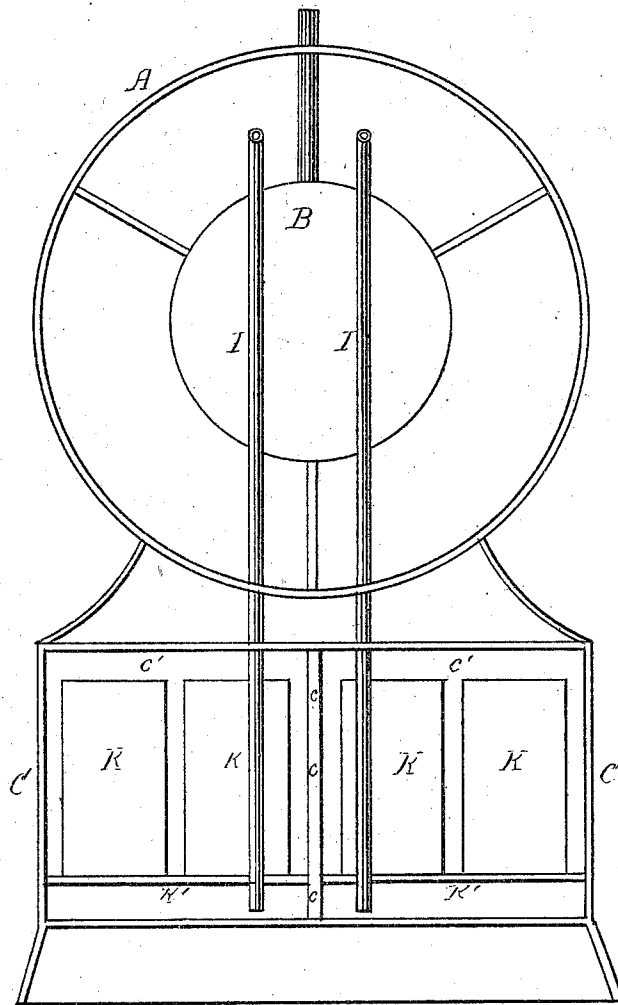
JOHN H. STEINER.

Improvement in Gas-Generators and Carbureters.

No. 126,652.

Patented May 14, 1872.

Fig. 2



Witnesses
J. L. Coombs
J. J. Coombs

Inventor
John H. Steiner
by C. L. Coombs
Atty.

JOHN H. STEINER.

Improvement in Gas-Generators and Carbureters.

No. 126,652.

Patented May 14, 1872.

Fig. 3

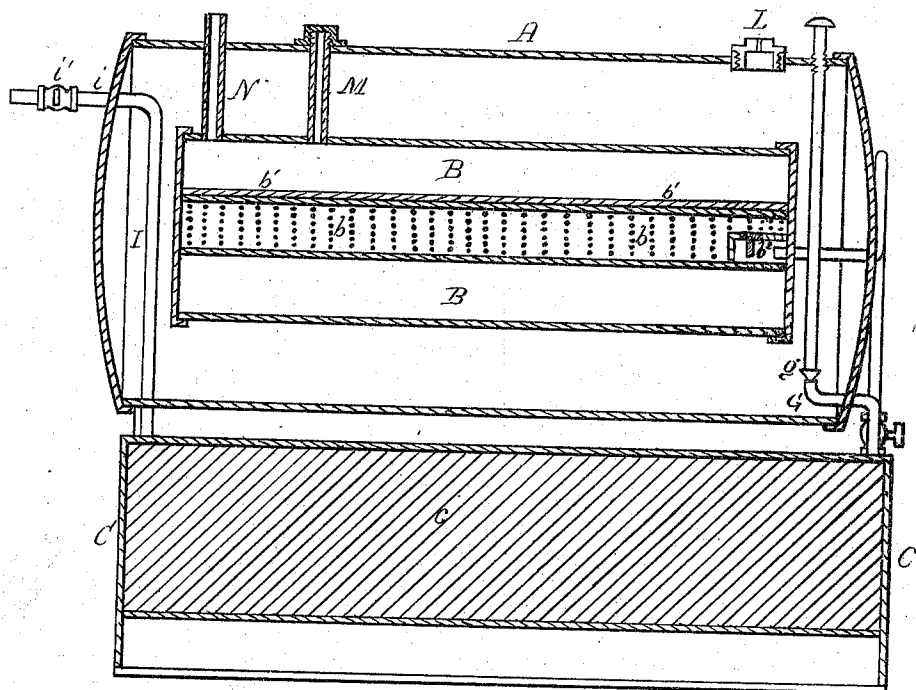
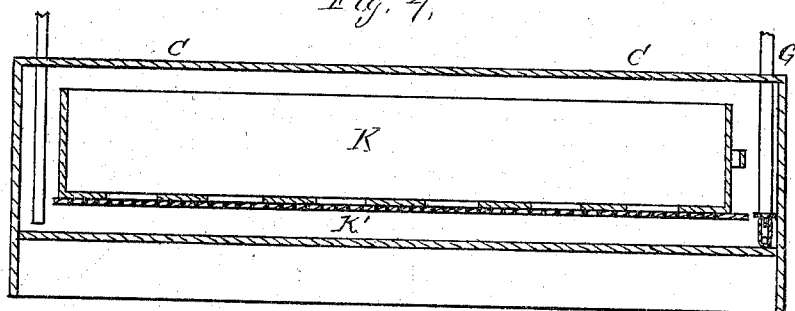


Fig. 4



Witnesses

J. J. Coombs
J. J. Coombs

Inventor

John H. Steiner
by C. L. Coombs
Atty.

UNITED STATES PATENT OFFICE.

JOHN H. STEINER, OF CINCINNATI, OHIO.

IMPROVEMENT IN GAS GENERATORS AND CARBURETERS.

Specification forming part of Letters Patent No. 126,652, dated May 14, 1872.

To all whom it may concern:

Be it known that I, JOHN H. STEINER, of Cincinnati, in the county of Hamilton and the State of Ohio, have invented certain new and useful Improvements in Machines for Generating and Carbureting Hydrogen Gas, of which the following is a specification:

The nature of my invention relates to certain improvements upon the patent granted to me the 9th day of April, 1872, for improvement in hydrogen-gas generators, No. 125,496; and it consists in a new and improved construction of the gas-generators whereby the dilute acid can be suddenly brought and retained in contact with a more extended surface of the metallic scraps than heretofore, and whereby the expense of constructing the machines will be considerably reduced without materially increasing the size of the apparatus. This I accomplish by forming the generators of a rectangular box or chamber, divided into two or more compartments by longitudinal partitions. My invention further consists in the construction and arrangement of the pipes for supplying the acid to the generator, in combination with suitable valves operated by screw-rods passing through the reservoir or generator, and so arranged as to close one or the other end of said pipes, whereby the apparatus may be conveniently controlled by the operator without the use of cocks, which are objectionable on account of their liability to become fast by the action of the acid upon the metal of which they are composed. My invention also consists in the combination of suitable automatic valves with the pipes leading from the generators to the carbureter, so as to prevent any escape of the gasoline into the generators while filling the carbureter, or from any sudden expansion of the gas or vapor within the same; and my invention further consists in a new and improved construction of the scrap-boxes, which consist of rectangular open troughs, perforated at their bottoms and sides, so that they may be charged without wholly removing them from the generating-chambers, and also that they may be conveniently washed while charged, and so that two or more may be employed in one generating-chamber without occupying too much space, in order to divide the charge and ren-

der the handling more convenient; and, lastly, in the combination of a removable perforated false bottom with said boxes and the generators.

In the drawing, Figure 1 represents a front view of my apparatus, with the cap of one of the generating-compartments removed; Fig. 2, a back view of the same, with the back of the reservoir removed; Fig. 3, a longitudinal section of my apparatus; and Fig. 4, a longitudinal section of one of the generating-compartments and scrap-box.

A represents the reservoir for the dilute acid, within which is a carbureting-chamber, B, located at or near the center of said reservoir, and extending nearly from end to end of the same. Within said carbureter is secured a perforated tube, *b*, extending from end to end of the same, and above it is secured a flat plate or shelf, *b*¹. The chamber B is to contain the highly volatile distillates of petroleum, such as gasoline, &c. The gas generated in the chambers below enters at one end of the tube *b*, and passes out through the perforations into and through the hydrocarbon oil, becoming highly carbureted. The object of the shelf *b*¹ is to more thoroughly distribute the gas. The space around the tube *b* may be filled with curled hair or its equivalent, in order to increase the surface exposed to the gas to be carbureted. C represents a rectangular box or chamber, divided by one or more longitudinal partitions, *c*, into two or more separate compartments, *c'* *c'*. Each compartment communicates with the reservoir by means of a tube or pipe, G, leading from the bottom of the reservoir into the bottoms of the generating-chambers. To the end of each pipe within the reservoir is adapted a valve, *g*, secured to a valve-rod extending through the top of the reservoir, through an aperture provided with a screw-thread, the valve-rod having corresponding screw-threads which engage those in the aperture. The ends of these rods are provided with suitable levers or wheels, by means of which the valves may be operated to open or close the ends of the tubes. Instead of having the valves at the ends of said tubes in the reservoir, a screw-rod may be arranged to pass through the tops of the generators so as to bear against the automatic valves at their ends, and press and fasten

them in contact with said ends, whereby the same object will be accomplished. The automatic valves at the ends of the tubes within the generators, when the valve-rods are drawn away from them, will rise to admit the acid-water, and fall and close the passage upon any back pressure within the generators. H H represent pipes, extending from the generating-chambers *c' c'* into the center of the front end of the carbureter, where they terminate within the perforated tube *b*. At the ends of said pipes, within the carbureter, are secured the automatic valves *b²*, which rise and open the pipes as the gas flows in, but fall and close them in the event of any back pressure, and thus prevent the escape of any gasoline into the generating-chambers. I I are pipes, extending from the bottom of the generating-chambers at their rear, up through the back portion of the reservoir into the same, where they terminate above the highest level to which the dilute acid can rise. From these pipes the branch pipes *i i* extend through the back of the reservoir, said pipes being provided with stop-cocks *i' i'*. These pipes serve to return the weakened or spent acid-water to the reservoir, or to discharge it from the apparatus entirely through the branch pipes, as may be desired. This is accomplished, automatically, by the pressure of the gas within the generators. K K represent the scrap-metal boxes, which consist of perforated rectangular troughs, which rest upon removable perforated false bottoms *K'* in the generating-chambers. Each generating-chamber *c'* may be provided with one of these boxes, of suitable size to contain a full charge; but I prefer to use two or more smaller boxes, placed side by side in each chamber, in order to divide the charge and render it more easy to be handled. At the front end of each chamber is a suitable opening for the admission of said boxes, said chambers being provided with suitable caps, by means of which the chambers may be securely closed. L is an inlet for filling the reservoir A, provided with a suitable cap having a small aperture through it for the admission of air. M is a pipe for filling the carbureter B, also provided with a cap; and N, the service-pipe for conveying the gas to the burners. O is a stop-cock at the lower part of the reservoir, for emptying it of its contents.

The operation of my apparatus will be readily understood. After being properly filled and charged, upon opening the valves *g* the acid-water will flow from the reservoir into

the generators, and coming into contact with the extended surface of metallic scrap in the boxes, will immediately commence to generate large quantities of hydrogen gas, which will pass over through the pipes H H into the carbureter B, and from thence to the burners.

It will be seen that, as the dilute acid rises in the generating-chambers it will meet with a larger quantity of metal, and the generation of the gas will be increased, thus increasing the pressure in the machine and stopping the flow of dilute acid into the generators until the pressure is removed by the gas escaping at the burners. If too much acid-water is suddenly admitted, the pressure of the accumulated gas will force it through the pipes I I, at the rear, back into the reservoir, thus rendering the action of the machine automatic. As the acid in the generator becomes weakened the pressure will be diminished, and fresh acid-water will be admitted automatically through the pipe G, and when it is too far gone for further use, the acid solution can be entirely discharged from any one or all of the generators by opening the cocks *i' i'* in their respective pipes I I, and temporarily stopping communication between the reservoir and the carbureter.

The generators can be used together or alternately, as desired, in the same manner as in my former patent, to which I have referred.

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

1. The rectangular box C, divided by one or more partitions, *c c*, into two or more generating-chambers, *c' c'*, substantially as and for the purposes set forth.

2. The combination of the pipes G G and valves *g g*, with the valve-stems passing out by a screw connection through the cylinder A.

3. In combination with the carbureter and the pipe or pipes for introducing gas into the same, I claim the automatic valve *b²*, (one or more,) substantially as and for the purpose described.

4. In combination with the rectangular generating-chambers (or either of them) with removable perforated false bottoms, I claim the rectangular, open, perforated troughs or boxes for holding scrap metal, substantially as herein described.

JOHN H. STEINER.

Witnesses:

DANIEL E. RYAN,
D. M. MARTIN.