2 Sheets—Sheet 1.

O. ZWIETUSCH.

CARBONIC ACID GAS GENERATOR.

No. 180,982. Patented Aug. 8, 1876.

Fig. 1.

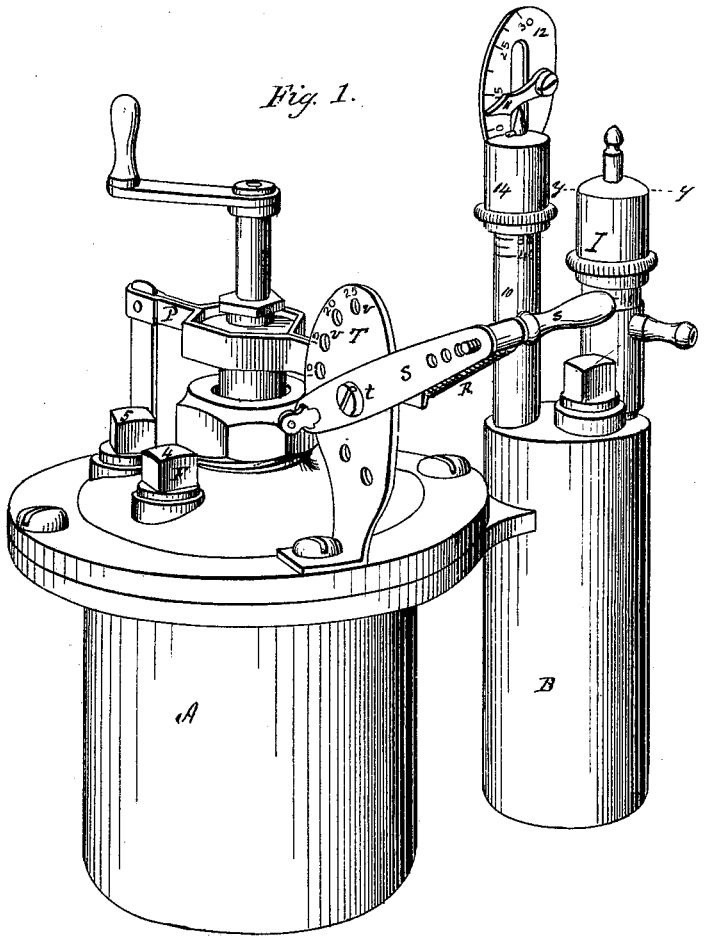
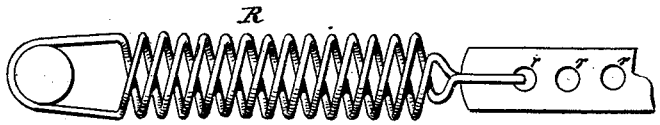


Fig. 4.



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2 Sheets—Sheet 2.

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CARBONIC ACID GAS GENERATOR.

No. 180,982. Patented Aug. 8, 1876.

Fig. 2.

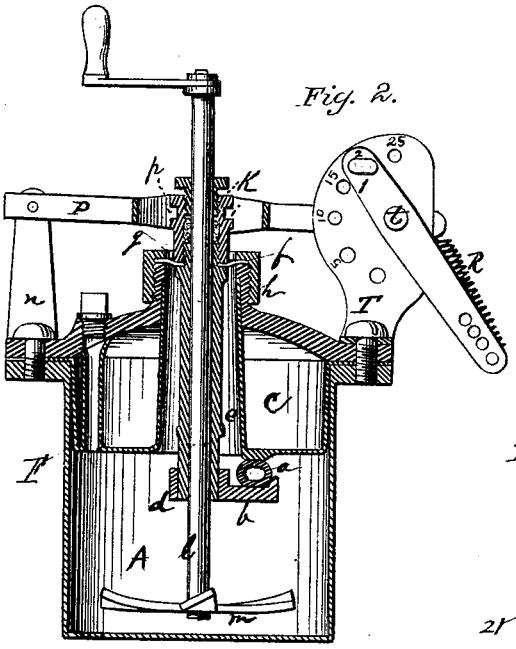


Fig. 5

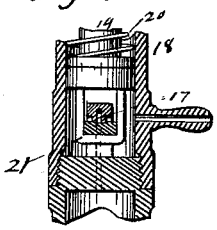
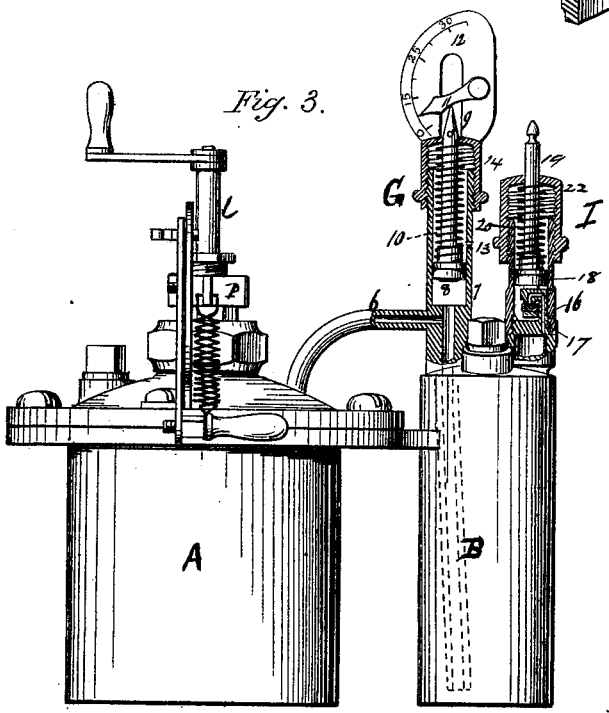


Fig. 3.



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UNITED STATES PATENT OFFICE.

OTTO ZWIETUSCH, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN CARBONIC-ACID-GAS GENERATORS.

Specification forming part of Letters Patent No. **180,982**, dated August 8, 1876; application filed June 10, 1876.

To all whom it may concern:

Be it known that I, OTTO ZWIETUSCH, of Milwaukee, Wisconsin, have invented a new and useful Improvement in Carbonic-Acid-Gas Generators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my invention. Fig. 2 is a vertical cross-section. Fig. 3 is a side elevation with portions broken away. Fig. 4 is a detail view of the double coiled spring. Fig. 5 is a partial section through *y y* of Fig. 1.

The object of my invention is to produce an economical, compact, and convenient generator and washer, provided with automatically-operating controlling devices, as hereinafter more particularly described and claimed.

In the said drawings, A is the generator, and B the gas-washer. In the upper part of the generator, and corresponding in outline, is a chamber, C, to contain the acid, and it is provided with a flexible pipe leading to the generating-chamber A, the pipe resting on and supported by a compressing-hook, *b*, attached to the lower end of a sleeve, *d*, which rises through the central opening *e* of the acid-chamber, and is attached to a flexible diaphragm, *f*. This diaphragm *f* has its outer edge secured between the edge of a central opening, *g*, in the cover *o* of the vessel A, and a screw-cap, *h*. The sleeve terminates in a grooved end, *i*, and is closed with a stuffing-box, K, through which descends a rod having an agitator, *m*, at its lower end, and a crank-handle at its upper end. To a bail, *n*, attached to the top *o* is pivoted a lever, P, having a central eye fitting over the end of the sleeve *d*, and lugs *p p* enter the groove *i*. The other end of the lever is provided with holes *r r*, in which to secure one end of a spring, R. The other end of the spring is attached to the handle *s* of a lever, S, which is pivoted to a plate, T, at *t*, rising from the top of the cover. The plate T has a series of holes, *v v*, arranged concentrically to the pivot *t*, and a pin, 1, and hole 2 allow the lever S being fastened at any one of the holes *v*, and thereby distending the spring R to any desired amount, so as to throw any necessary pressure on the flexible diaphragm *f*, and control the acid cut-off at *a* by means of the sleeve *d* and clamping-hook *b*. The movement of the lever S on its pivot *t* is eccentric to the movement of the spring R around the end of the lever P. The holes *v v* are numbered to indicate the number of pounds pressure a given distention of the spring indicates. By turning the lever S horizontally and the handle upward, the lever P will be lifted and the pipe *a* closed, and kept so regardless of any pressure within the chamber. F is a conduit to introduce the alkali, and it passes through the acid-chamber *c*, and is closed by a screw-cap, 4, and 5 is a passage for the acid, also closed with a cap.

After the gas is generated it passes through the pipe 6 to the washer. Located on this pipe is a safety-valve and gage, G, which is constructed as follows: A barrel, 7, incloses a piston, 8, having a rod, 9, projecting through an opening in the top, and a coiled spring, 10, around the rod. Above the barrel is an indicating-hand, 11, and dial 12, the end of the rod 9 bearing against the hand. A relief-valve is shown at 13. The pressure in the chamber A is exerted against the piston 8, and the rod is forced upward, so as to indicate, by the hand 11, the number of pounds per square inch. When the piston is forced past the opening 13 the gas escapes to the air, and no danger of explosion can exist. By means of the screw-cap 14 on the end of the barrel the spring can be compressed more or less, and the relief-valve set to operate at any given pressure, graduations being marked as seen in Fig. 1. A pressure-equalizer, I, is located between the washer and the beer-barrel in which the gas is to be used. This is for the purpose of utilizing the back pressure to cut off the supply of gas when the pressure in the barrel becomes too heavy. A barrel, 16, communicates with the washer or purifier by means of a pipe, 17, provided with a channel opening downward. In this barrel is a piston, 18, with a rod, 19, and a spring, 20, coiled around it. Attached to the lower side of this piston is a stirrup-valve, 21, (see Fig. 5,) arranged to close the channel in pipe 17. The distention of the spring keeps the valve open in its normal condition, and the amount of back pressure required to close the valve is

governed by the compression of the spring through the medium of the screw-cap 22.

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

1. The levers P and S, moving eccentrically to each other, in combination with a connecting double coiled spring and a perforated plate, T, substantially as described.

2. The safety-valve and gage combined, consisting of the barrel 7, with opening 13, screw-cap 14, piston 8, spring 10, rod 9, hand 11, and dial 12, all constructed and operating as set forth.

3. In a pressure-equalizer, the combination of a downward-opening channel, 17, a stirrup-valve, 21, and a piston, 18, with a coiled spring, 20, around its rod, substantially as described.

4. In combination with a carbonic-acid-gas generator, the internally-arranged acid-chamber c, provided with the central opening *e*, and traversed with an alkali-channel, F, as and for the purpose described.

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