E. H. & W. H. COVEL.

Gas Machine.

No. 84,460. Patented Nov. 24, 1868.

Fig. 2

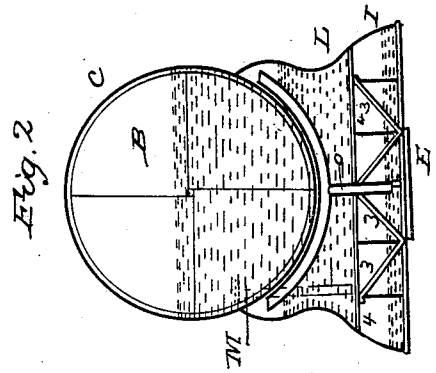


Fig. 1

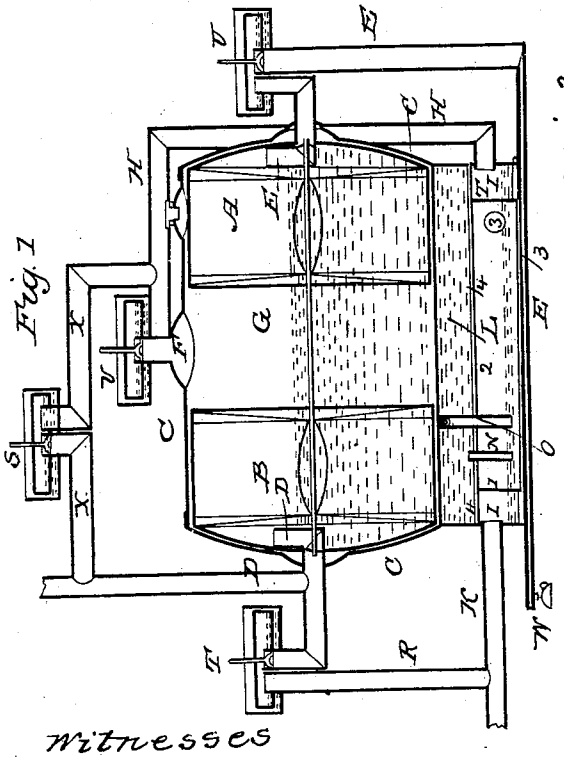
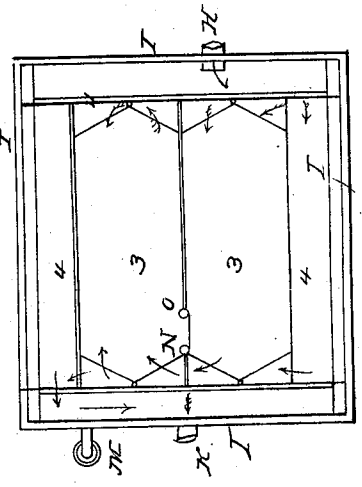


Fig. 3



Witnesses

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UNITED STATES PATENT OFFICE.

E. HALL COVEL AND WILLIAM H. COVEL, OF NEW YORK, N. Y.

IMPROVED GAS-MACHINE.

Specification forming part of Letters Patent No. **84,460**, dated November 24, 1868.

To all whom it may concern:

Be it known that we, E. HALL COVEL and WILLIAM H. COVEL, of the city, county, and State of New York, have invented certain Improvements in Combination Gas-Machine; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to which it most nearly appertains to make and use our said invention or improvement.

Our invention consists in an improvement in combination gas-machines, and is composed of one or more pumps, or their equivalents, a chemical tank, an inclosed space or carbonizer, an air pipe or conduit, and a heating device, with their appropriate pipes, connections, valves, cocks, regulators, detainers, &c., as hereinafter described.

In order to enable others skilled in the art to manufacture our machine, we will proceed to describe the various parts, reference being had to the accompanying drawings, in which like characters or letters in the different views of the machine refer to like parts.

Figure 1 represents a vertical section, and Fig. 2 a transverse section, of the entire machine; Fig. 3, a horizontal section of the inclosed space or carbonizer.

In the drawings, A and B represent two rotary-meter pumps, placed on the same shaft within case C, and so arranged that both are driven by pressure of the gas coming through gas-service pipe D upon the fans or wings of gas-pump B, and deliver the pump A atmospheric air, and the pump B inflammable gas, to a common point or space, G, where they can mingle.

We do not, however, confine ourselves to this mode of construction, as we do not always place pumps A and B within one case or on one shaft, or always use rotary pumps, as shown in the drawings, as any device for forcing gas or air along pipes having a steady, uniform motion will answer the purpose intended by the use of pumps A and B, as described.

Should the pressure of the gas on the wings or fans of pump B be insufficient to propel it, together with pump A, one or both may be driven by any of the well-known mechanical devices.

When pumps A and B are both placed within one case, we use the space G between the pumps as a mixing-chamber; but when the pumps are separated, apertures or outlets are made in their respective cases, communicating with pipe H, within which the mixing takes place.

F is the outlet to space G, or place where pipe H joins case C, when the construction is as shown in the drawings. H is a pipe used to connect the pumping device with the carbonizer or inclosed space I. E is a pipe supplying pump A with air, having at any convenient point a regulator, valve, cock, or other device, U, placed in or upon it, so constructed that, either automatically or otherwise, pipe E shall or may be closed when the pump A is not in action. W represents a lamp, gas-burner, or any other heating device that will serve to heat the air within pipe E, and is generally placed at some point along pipe E before said pipe E comes in contact with casing of carbonizer or inclosed space I. K is a gas-supply pipe, leading from the carbonizer or inclosed space I to the place where the gaseous mixture is to be consumed. X is a gas-service pipe opening into space G or pipe H, according to construction of pumps A and B, and having at any convenient point a regulator, valve, cock, or other regulating or checking device, S, for entirely or partially closing pipe X. R is a pipe leading from gas service pipe D to gas-supply pipe K, and having at any convenient point a regulator, valve, cock, or other regulating or checking device, T, for entirely or partially closing pipe R. V is a regulator, cock, valve, or other regulating or checking device placed in or upon pipe H. When a cock or similar device is used in place of valves S, T, or U, as shown in the drawing, the pipes X, R, or E are not broken, as shown in the drawing, but united in the usual way. M is a pipe used for filling chemical or fluid tank L, (placed over carbonizer or inclosed space I,) and extends from outside and above top of tank L to within and near bottom of tank L. N is a supply-pipe, commencing at a point above the bottom of filling-pipe M and, extending through bottom of tank L, ends near, but not touching, bottom of carbonizer or inclosed space I. O is a ventilating-pipe, commencing at a point near the highest portion of tank L, and ending at a point on a level with the bottom of pipe N.

When the tank L is of irregular form, the ventilating-pipe O may have one or more branches, or else two or more ventilating-pipes may be used; but in such event the branches or auxiliary pipes must commence and end at points level with ends of pipe O.

In Fig. 3, I represents the outer casing of the carbonizer or inclosed space. Nos. 1 and 1′ represent two partitions extending across the outer case, I, but having openings of sufficient size to allow the gas to pass freely through them. Nos. 2 2 2 2 2 are partitions, meeting Nos. 1 and 1′ at right angles, and having openings so arranged that the gas will be compelled to travel backward and forward, as shown by the arrows. Nos. 3 3 3 3 represent a continuous sheet of felt or other porous material, extending alternately from the bottom to the top of Nos. 2 2 2 2 2, as shown in Fig. 2, and cutting the passages or spaces between partitions Nos. 2 2 2 2 2 into two equal parts. Nos. 4 and 4 represent a sheet of felt or porous material stretched from the upper portion of partition No. 1 to the upper portion of partition No. 1′, and touching the sheet of felt or porous material Nos. 3 3 3 3 at those points where said sheets Nos. 3 3 3 3 pass over or to the top of partitions Nos. 2 2 2 2 2, as shown in Fig. No. 2.

We sometimes lead the pipe E through the inclosed space or carbonizer I, instead of along the outer case of I, but in doing this always so place pipe E that it may come near or in actual contact with the chemicals contained in inclosed space or carbonizer I.

Having thus described the construction of our invention, it is obvious that, however propelled, the rotary pump B in case C will draw from the pipe D a supply of gas and deliver the same into the open space G; that the rotary pump A in case C will draw through the pipe E a supply of air, and deliver the same also into the open space G; that the gas and air thus thrown into the open space G will acquire a mean temperature, mingle, and pass from thence into the pipe H through opening F; that in passing the valve, cock, regulator, or other device, V, the force of the flow of the mixture in pipe H may be so regulated that the pressure in the carbonizer or open space I will be such as will most readily allow the chemicals in the carbonizer or open space I to unite with or be taken up by the mixture thrown through pipe H by the action of the pumps A and B; that the fluid chemicals flowing through outlet-pipe N of the chemical-tank L, and partially filling carbonizer or inclosed space I, will be taken up by porous sheet Nos. 3 3 3 3 from the bottom of inclosed space or carbonizer I; that the felt or porous sheet Nos. 4 and 4, tightly stretched across the tops of partitions Nos. 1 and 1′, will imbibe a portion of the chemicals from the felt or porous sheets Nos. 3 3 3 3; that the mixture, thrown through pipe H as aforesaid, while flowing through the channels formed by partitions Nos. 1 and 1′, 2 2 2 2 2 being divided into portions by saturated sheets of felt or porous substance, Nos. 3 3 3 3 coming into contact with the chemicals lying on the bottom of the carbonizer or inclosed space I, and also with the saturated felt or porous sheet Nos. 4 and 4, will unite with, take up, and carry forward with it, through pipe K, to the burners all the volatile portions of the chemicals supplied from chemical-tank L by outlet-pipe N.

The pipe X, with cock, valve, regulator, or other device, S, opening and closing either automatically or otherwise, leading from gas-service pipe D to space G or pipe H, as may be deemed desirable, is for the purpose of adding an excess of gas at certain times to the mixture thrown forward by means of rotary pumps A and B.

The pipe R, with cock, valve, regulator, or other device, T, opening and closing either antomatically or otherwise, is for the purpose of adding pure gas to the compound forced through pipe K.

The filling-pipe M of the chemical-tank L is brought below the top of the outlet-pipe N, so that its lower end may always be sealed by the chemicals remaining in the bottom of tank L, thus preventing the escape of any gas or odor, or the entrance of any air, while filling tank L or opening pipe M for the purpose of examination.

Pipes N and O in tank L, taken together, constitute an automatic feed, supplying inclosed space or carbonizer I with fresh fluid whenever the level of the fluid in carbonizer or inclosed space I shall fall below the bottom of tubes N and O.

Gaseous vapor, passing up tube O into tank L, causes the fluid chemicals to flow down pipe N until the ends of tubes N and O are sealed, when, no more vapor passing up tube O, a partial vacuum is formed in the upper part of tank L, and the flow down tube N of the fluid ceases.

When pump A is not in action the heated air generated in pipe E by means of the device W or its equivalent escapes into the atmosphere without volatilizing and driving into the pipe K the chemicals contained in carbonizer or inclosed space I; but when pump A is in action the heated air is drawn along the bottom of inclosed space or carbonizer I, warming the chemicals contained therein and rendering them more volatile, thence into pump A, by which it is thrown forward to be mixed with the gas delivered by pump B. This arrangement prevents any ill effects from neglecting to turn off or extinguish the heating device when the lights are not burning.

U represents a floating valve, closing pipe E when at rest; but upon the starting of pump A a partial vacuum is formed between valve U and pump A, the atmosphere presses upon the upper part of valve U, forces it down, and air is allowed to enter pump A.

The valve U herein described is only one of the many devices that may be used to close pipe E at the desired point.

The object of closing pipe E when the pump A is at rest is to prevent the evaporating of the seal in which pump A revolves from the action of the heated air coming from the direction of heating device W, or its equivalent, and also, when pumps A and B are inclosed in one case, as shown in the drawings, to prevent the issue of gas through pipe E, should the seal in which pumps A and B revolve be destroyed by evaporation, leakage, or other cause.

We do not confine ourselves to the particular carbonizer shown in our drawings, but exhibit it as a cheap and simple form that we find adapted to our purpose.

The adding of pure gas either before or after the mixture has been carbonized is to enable us to give a gas of exactly the photometric value required by the business of the consumer.

Having thus described the construction of our invention, its operation, and the new principle of making, illuminating, and heating mixtures contained in it, what we claim, and desire to secure by Letters Patent, is—

1. Mixing atmospheric air and any of the inflammable gases, and then adding to the mixture certain further proportions of the gas before passing the same over or through the carbon-supplying materials.

2. Mixing atmospheric air and any of the inflammable gases, and then adding to the mixture certain further proportions of the gas after the said mixture has been passed over or through the carbon-supplying materials.

3. Pumps A and B, in combination with an inclosed space or carbonizer, I, fluid or chemical tank L, and feed-pipe or opening N, or their equivalents, when used to add new constituents to the mixture of air and gas produced by the action of pumps A and B, and to keep up the supply of such new constituents.

4. Pump A, pump B, tank L, feed-pipe N, ventilating pipe or pipes O, and inclosed space I, or their equivalents, with the usual couplings and connections known in the business, when combined for the purpose of mixing air and gas, supplying new constituents to such mixture, and keeping up automatically the supply of such new constituents.

5. The combination of filling-pipe M, feed-pipe N, ventilating pipe or pipes O, and tank L with inclosed space I, constructed and operating substantially as and for the purpose hereinbefore described.

6. Pump A, pipe E, and carbonizer or inclosed space I, or their equivalents, in combination with a lamp or any other heating device, operating substantially as and for the purpose described.

7. The pumps A and B, in case C, tank L, and an inclosed space or carbonizer, as arranged.

8. Pump A, pump B pipe H, and an inclosed space or carbonizer, combined with a regulator, valve, cock, or other device for checking or regulating pressure, or their equivalents, operating substantially as and for the purpose hereinbefore described.

9. Pump A and pipe E, or their equivalents, combined with a regulator, valve, cock, or other device placed in or upon pipe E, when so constructed that, either automatically or otherwise, pipe E shall or may be closed when the pump A is not in action, for the purposes hereinbefore described.

10. Pump A and pipe E, or their equivalents, and lamp W or other heating device, combined with a regulator, valve, cock, or other closing device placed in or upon pipe E, when so constructed that, either automatically or otherwise, pipe E shall or may be closed when the pump A is not in action, and the hot air generated by the heating device W or its equivalent, instead of passing up pipe E, shall be forced to discharge itself into the air.

11. Pump A and pipe E, or their equivalents, in combination with a heating device, operating substantially as and for the purpose hereinbefore set forth.

12. Gas-service pipe X, pump A, pump B, pipe D, and their equivalents, in combination with a regulator, valve, cock, or other device for checking or regulating pressure, and space G, for the purpose of adding a further supply of gas to that already furnished by pump B, and controlling proportions of gas and air in space G.

13. Gas-service pipe X, having in or upon it a regulator, valve, cock, or other device for checking or regulating pressure, in combination with pipe H and carbonizer or inclosed space I, for the purpose of controlling proportions of gas and air caused to enter the inclosed space or carbonizer I.

14. The combination of gas-service pipe D, gas-supply pipe K, and cross-pipe R, having in or upon it a regulator, cock, valve, or other device for checking or controlling pressure, or their equivalents, when substantially constructed and arranged as described, and for the purpose set forth.

15. Forming channels and bisecting the same within the carbonizer or inclosed space I by means of partitions and sheets of porous substance, when constructed and arranged substantially as shown and described, and for the purpose set forth.

16. The combination of the pumps A and B, pipe H, tank L, pipe N, pipe O, heating device W, pipe E, and a carbonizer or inclosed space, or their equivalents, when arranged to substantially operate in the manner and for the purpose hereinbefore described and set forth.

17. The improvement in combination gas-machines, constructed and operating substantially as hereinbefore described and set forth.

E. HALL COVEL.

Witnesses: W. H. COVEL.

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