T. G. Springer.

Carburretor.

No. 97,718. Patented. Dec. 7. 1869.

Fig 1.

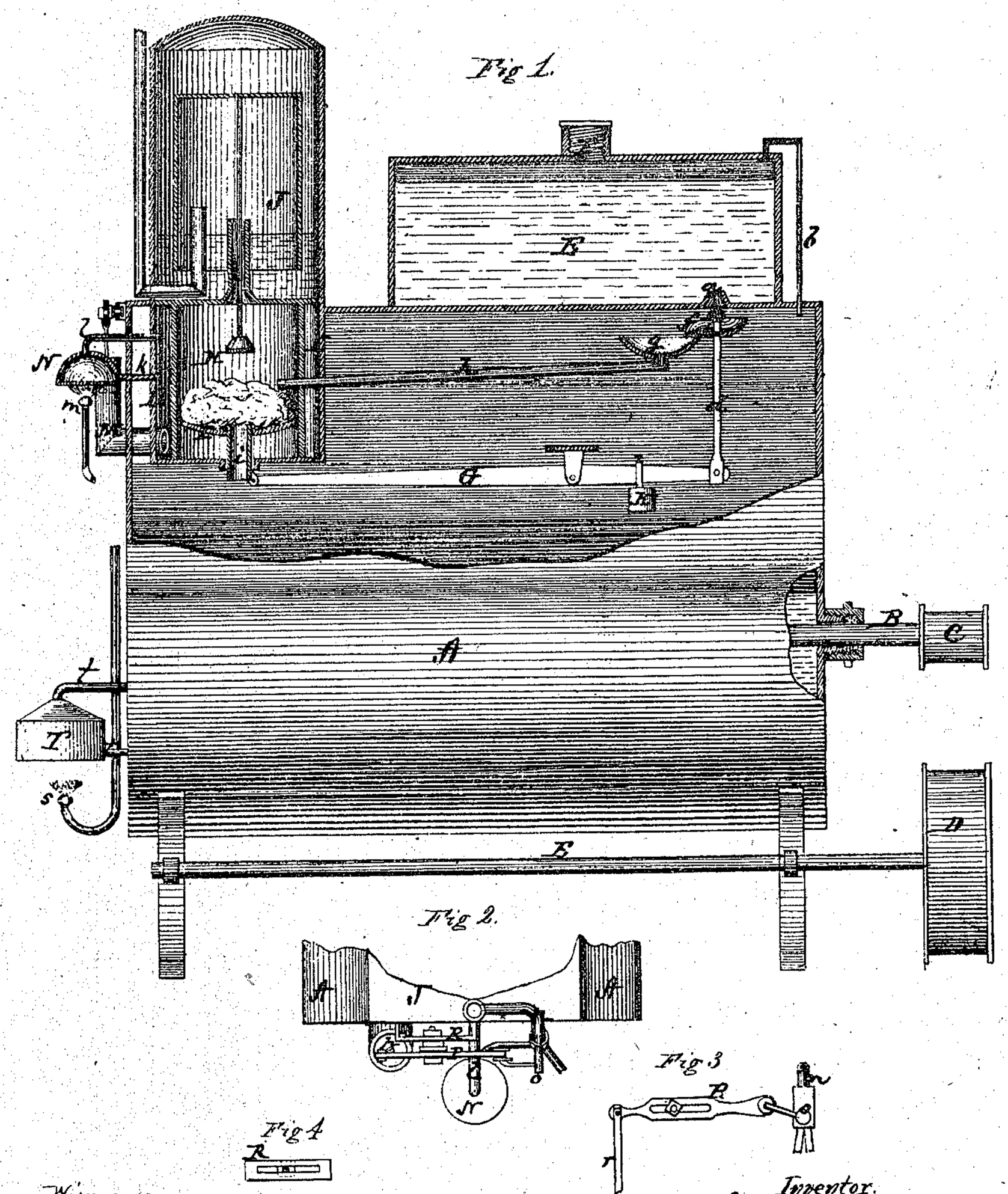

Fig 2.

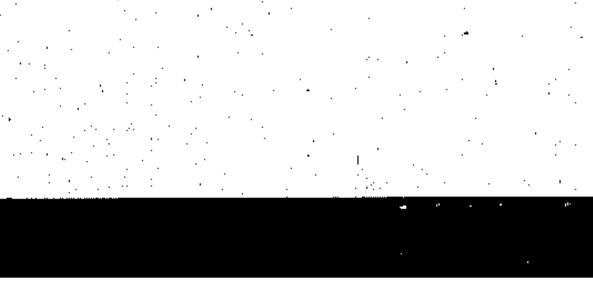

Fig 3

Fig 4

Witnesses.

Harry King.

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Inventor.

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per Alexander Mason

Atty.

UNITED STATES PATENT OFFICE.

T. G. SPRINGER, OF CLINTON, IOWA.

IMPROVED GAS-MACHINE.

Specification forming part of Letters Patent No. **97,748**, dated December 7, 1869.

To all whom it may concern:

Be it known that I, T. G. SPRINGER, of Clinton, in the county of Clinton and in the State of Iowa, have invented certain new and useful Improvements in Carbureters; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in so constructing a carbureter that the gasoline, or other material used, will feed itself automatically, in exact proportion as it is being evaporated and used; and, also, in automatically regulating the temperature of the gasoline or other material used, so as to produce at all times an illuminating-gas of the desired brilliancy.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a longitudinal vertical section of my entire machine. Fig. 2 is a plan view of the front end of the machine. Fig. 3 is a front view of the device for automatically regulating the temperature of the gasoline; and Fig. 4 is a view of the bar to which said device is attached.

A represents the water-reservoir of the machine, through which passes the shaft B. On this shaft is the usual meter-wheel, for forcing air from the outside above the water in the water-reservoir, the water covering the shaft and the inlet of the air, so as to retain the air, and create the necessary pressure.

Upon the outer end of the shaft B is a pulley, C, connected by a belt with the pulley D on the shaft E, said shaft and pulley being revolved by means of a rope or chain and weight, so as to cause the shaft B and its meter-wheel to revolve.

On top of the water-tank A is placed the reservoir E, containing gasoline or other suitable material, an opening, *a*, leading from the bottom of the reservoir E to the tank A.

The gasoline is admitted into the reservoir E through an opening, F, which is afterward hermetically sealed.

A portion of the air above the water in the tank A is conducted above the gasoline in the reservoir E by means of a pipe, *b*, so as to equalize the pressure of the air above and below the gasoline, for else the gasoline would not flow through the aperture *a* when it is opened.

In the air-space of the tank A is pivoted a lever, G, to one end of which is pivoted a bar, *d*, which extends perpendicularly, or nearly so, upward, so that a valve, *e*, attached to its upper end, may close the aperture *a* from below, and prevent the escape of the gasoline.

When, however, said valve is slightly depressed, the gasoline flows into a cup, *f*, attached to the bar *d*, directly under the valve *e*, and from said cup, through the receptacle *g* and pipe *h*, into the generating-chamber H.

In the center of the bottom of the chamber H is an opening, through which passes a tube, *i*, having, at its upper end, within the generating-chamber, a cup, I, upon which is placed a sponge or other suitable porous material.

The gasoline, flowing from the pipe *h*, saturates the sponge on the cup I, and the air passing upward from the tank A, through the pipe *i*, and through the saturated sponge, becomes carbureted, and rises upward, passing into the gasometer J. This gasometer is constructed in any of the known and usual ways, and needs no description.

The lower end of the tube *i* is attached to the other end of the lever G, which lever thus forms a balance to regulate the flow of gasoline from the reservoir E.

A weight, K, is suspended from that end of the lever to which the bar *d* is attached.

It will readily be seen that if the balance thus formed is set by means of the weight K, so that the valve end is, say one ounce, heavier than the cup end, then the valve *e* will drop down, allowing the gasoline to flow into the cup I, until a trifle more than an ounce has passed into the same, when this end, becoming the heaviest, drops down, closing the valve *e*, and cutting off the supply.

As, now, the gasoline in the fibrous, or rather porous, material in the cup I evaporates by the passage of the air through the same, the cup I again becomes lighter, which causes the valve to open and more gasoline

be supplied. Hence, this balance causes the gasoline to be supplied only as it is wanted, and does this automatically.

By changing the position of the weight K, the amount of gasoline furnished is readily regulated, and, when once set, it need not be moved.

I do not confine myself to any particular construction of the device by which the flow of the gasoline is thus regulated, as I claim to be the first inventor of regulating such supply by means of a balance, of whatever construction the same may be.

The generating-chamber H is surrounded by an outside chamber, L, which is filled with alcohol or other suitable fluid which is capable of expansion and contraction, as it is cold or warm.

From this chamber, near its bottom, a pipe, M, extends horizontally outward, and then turns vertically upward, its upper end being left open.

The alcohol or other fluid contained in the chamber L is thus allowed to rise and fall in the pipe M, as it is being expanded or contracted by heat, in the following manner:

From the chamber L a pipe, *k*, leads into a cup or heating-chamber, N, and another pipe, *l*, leads back again into the chamber L. Under the cup N is placed a burner, *m*, which is supplied with gas through a pipe, *n*, leading from the pipe that carries the gas off from the gasometer J. This pipe *n* is provided with a stop-cock, *o*, so arranged that when nominally closed it shall still allow sufficient gas to escape to form a blue blaze, creating no heat at the burner *m* under the cup N. In the pipe M is placed a plunger or piston, *p*, which, by a rod, *r*, is connected with one end of a lever, P, the othor end of said lever being connected with the stop-cock *o*. The lever P is slotted longitudinally and pivoted to a longitudinally-slotted bar, R, by means of bolt and screws, so that the fulcrum of the said lever may be changed when desired.

Now, if the lever P is set so that when the alcohol or other fluid in the chamber L is at the desired temperature, the piston *p* floats upon said fluid in the pipe M, and then stop-cock *o* closed, then it is evident that as evaporation takes place within the generating-chamber H, the fluid will become cooler, and hence contract. This will lower the plunger or piston *p*, opening the stop-cock *o*, so that more or less gas will be furnished to the flame at the burner *m*, and, consequently, heat the fluid in the cup N. This cup, being supplied from the chamber L, the entire volume of fluid becomes heated, and as soon as it then expands again, the piston *p* is raised, the stop-cock *o* closed, and the supply of gas shut off. By this means I am enabled to maintain the same temperature, at all times, around the generating-chamber H, which is one of the most, if not the most, important points in a carbureting-machine, and one which has never been accomplished heretofore.

The object of regulating the temperature is to maintain, at all times, the same brilliancy of the gas. In evaporating gasoline or other such materials cold is always produced to a greater or less degree, and cold, it is well known, prevents evaporation, and hence the importance is readily seen of maintaining the proper temperature in the generating-chamber. This temperature is different for the different kinds of material used, according to their specific gravity, and for this purpose I have made the lever P adjustable, so that it can be accommodated to any kind of material used. The same idea may be carried out without fluid, by substituting mercury or any other material capable of being readily expanded and contracted by heat and cold, and hence I do not confine myself to the use of fluids alone, but claim the use of any material by which the same results may be obtained.

Another great objection to the carbureters or gas machines now in use is that the water contained in the tank A is liable to become frozen in cold weather. To obviate this difficulty I provide a closed cup or heating-chamber, T, connected by pipes *t t* with the tank A, below the water-line, and place a burner, *s*, under the same, said burner being supplied by a pipe leading from the pipe *n*. The gas supplied to the burner *s* is regulated by the same stop-cock *o* as the burner *m*, and hence the water will only be heated when absolutely necessary; or I may, if deemed of greater advantage, have a separate stop-cock for the pipe leading to the burner *s*.

It will thus be seen that I accomplish three distinct and separate objects, all of which are of the most vital importance in such machines, namely: first, automatically regulating the flow of the carbureting material by balances, so that said material will be supplied only in proportion as it is being evaporated and used; second, I maintain, automatically, an even temperature around the generating-chamber; and, third, I prevent the water from freezing.

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

1. Regulating the flow of the carbureting-material into the generating-chamber automatically by balances, in such a manner that it will be supplied only in proportion as it is needed for evaporation and use, substantially as herein set forth.

2. Maintaining automatically within the generating-chamber of a carbureter or gas-machine the necessary degree of temperature, by means of the expansion and contraction of any suitable material used for that purpose, substantially as herein set forth.

3. Surrounding the generating-chamber of a carbureter or gas-machine with a suitable

fluid or other material capable of being expanded and contracted by heat and cold, substantially as herein set forth.

4. Maintaining the same degree of pressure of the atmospheric air, both above and below the carbureting material, substantially as herein set forth.

5. The combination of the water-tank A, reservoir E, aperture *a*, and air-pipe *b*, all constructed and arranged substantially as and for the purposes herein set forth.

6. The balance G, provided at one end with the adjustable weight K, rod *d*, and valve *e*, and at the other with the tube *i* and cup I, substantially as and for the purposes herein set forth.

7. In combination with the balance thus constructed, the cup *f*, receptacle *g*, and pipe *h*, all constructed and arranged substantially as and for the purposes herein set forth.

8. The arrangement of the generating-chamber H, tube *i*, and cup I, the latter provided with sponge or other suitable porous material, substantially as and for the purposes herein set forth.

9. In combination with the generating-chamber H, the outside chamber L and pipe M, constructed and arranged substantially as and for the purposes herein set forth.

10. The piston or plunger *p*, rod *r*, adjustable lever P, and stop-cock *o*, all constructed and arranged to operate substantially as and for the purposes herein set forth.

11. The combination of the longitudinally-slotted lever P, and the longitudinally-slotted bar R, substantially as and for the purposes herein set forth.

12. The heating-chamber N, with pipes *k l* leading to the chamber L and the burner *m*, constructed and arranged substantially as and for the purposes herein set forth.

13. The heating-chamber T, with pipes *t t* and burner *s*, constructed and arranged substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of November, 1869.

T. G. SPRINGER.

Witnesses:

C. L. EVERT,

A. N. MARR.