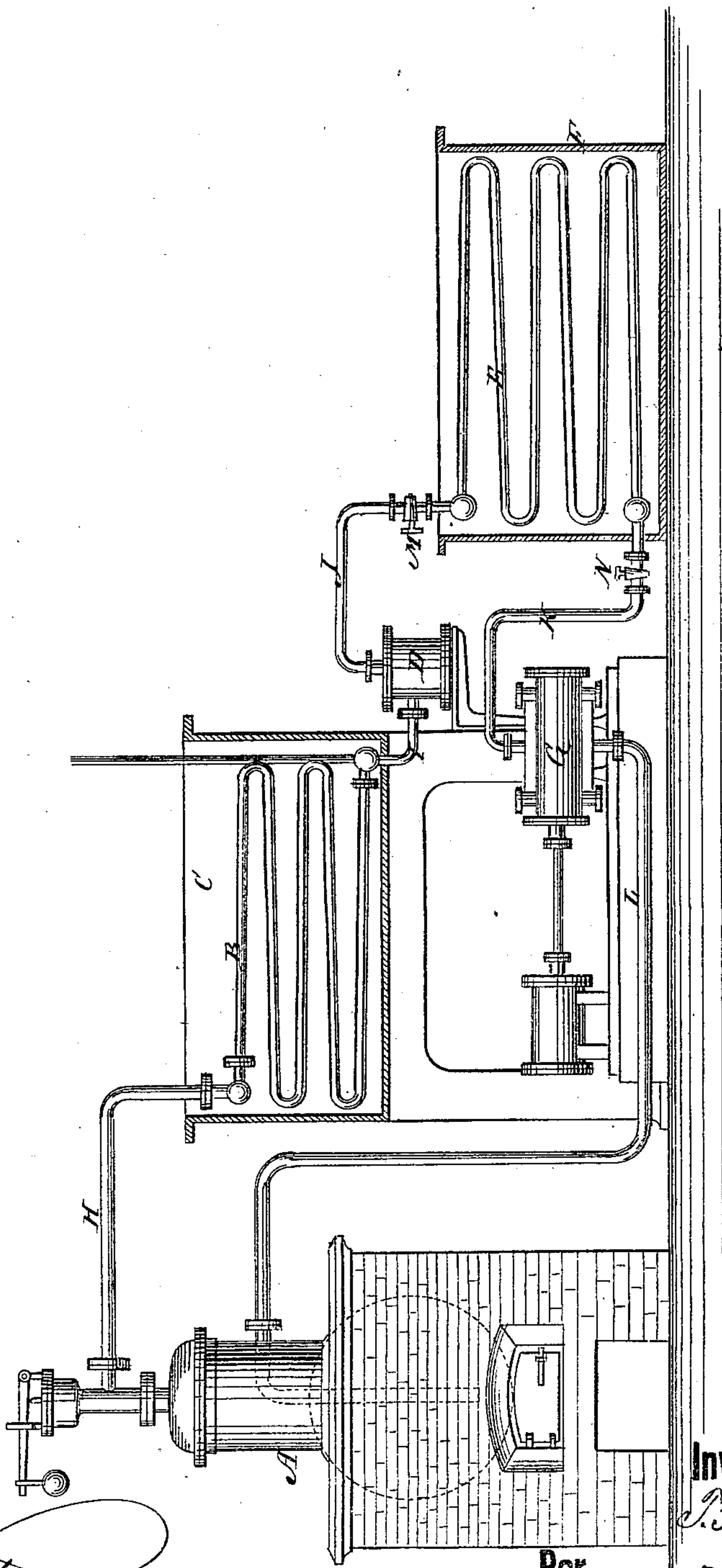


T. F. PETERSON.

Ice-Machines.

No. 148,751.

Patented March 17, 1874.



Witnesses:

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# UNITED STATES PATENT OFFICE.

THOMAS F. PETERSON, OF MACON, GEORGIA.

## IMPROVEMENT IN ICE-MACHINES.

Specification forming part of Letters Patent No. 148,751, dated March 17, 1874; application filed September 27, 1873.

*To all whom it may concern:*

Be it known that I, THOMAS F. PETERSON, of Macon, in the county of Bibb and State of Georgia, have invented a new and Improved Ice-Machine, of which the following is a specification:

My invention consists of a boiler, condensing-coil and cooling-tank, receiver, freezing coil and tank, and pumps, all combined and arranged so that the ammoniacal gas expelled from the boiler by heat is compressed and condensed in the condensing-coil, and then, after passing through the receiver, is let into the freezing-coil, so as to expand therein and freeze the water in the tank by taking up the heat from it, and is then pumped directly into the boiler again for repeating the process, and takes with it the heat obtained in the freezer, and thus utilizes it instead of wasting it, as is done in other ammoniacal-gas machines, by withdrawing a portion of the weak ammoniacal water from the boiler for the purpose of absorbing the gas before pumping it back into the boiler, which necessitates the use of a large quantity of water for cooling the gas and the ammoniacal water, so that the former will be absorbed by the latter. I also economize largely in cost of machinery by saving the necessary apparatus for cooling the ammoniacal water.

The drawing is a side elevation of my improved apparatus.

A represents the boiler, which will be of any approved kind, and arranged in a furnace in any suitable way. B represents the condensing and compressing coil, which is arranged in a tank, C, so that cold water can be caused to flow over it to condense the gas. D is the receiver, into which the gas flows from the condenser. E represents the expanding-coil, which is arranged in the freezing-tank F; and G represents the pumps for withdrawing the gas from coil E and forcing it back into the boiler A. H, I, and J are the pipes forming the connections from the boiler to the freezing-coil; and K and L are the pipes making the connections from the freezing-coil back to the boiler. M and N are cocks for closing the connections and regulating the flow. The cock M has to be adjusted so as to limit the

admission of the gas to the freezing-coil to a certain extent necessary for allowing the gas to expand as it enters the freezing-coil.

The boiler is filled about half full of water of ammonia of 26° Baumé. Heat is then applied, which causes a separation of the ammoniacal gas, and forces it into coil B, and compresses it. The heat developed by compression and liquefaction is conducted away by the water flowing through the tank C. The liquefied gas and watery vapor condensed with it pass into the receptacle D, and from it, through the pipe J and regulating-cock M, and are allowed to expand in the coil E in the freezing-box, by which they take up the heat of surrounding objects, and thus freeze the water contained in cans placed in said freezing-box. From the coil E the water is forced back into the boiler A again by the pump G.

In practice, I use two pumps, so that when one becomes disabled by wear of the packing and the like, which very frequently happens in this service, the other can be turned on.

My invention differs from other ammonia ice-machines, as follows: In mine the gas is returned from the freezing-coil directly into the boiler. In the others it passes from the freezing-coil into what is called the "vase of absorption," where it mingles with and is absorbed by weak ammonia-water drawn from the boiler. This water has to be cooled before it enters the vase to receive the gas, and it sets free the heat which the gas obtains by expansion in the freezing-coil, which must be conducted away by water running over the coil in the absorption-vase. For this purpose, as much water is required as is required to carry off the heat from the liquefaction-coil. Thus double the quantity is required that I require, and much heat is wasted which I utilize in the boiler. Moreover, I dispense with the absorption-vase, the coil within it, and the means for causing the water to circulate through the vase, besides the connections, which add largely to the expense.

I am aware that there are ice-machines provided with analyzer and rectifier, and having the absorber in direct connection with the refrigerator; but I dispense with the two former, and connect the refrigerator directly with

the boiler, whereby I pump the ammoniacal fluid with the acquired heat directly into the boiler, thus making not only a cheaper machine, but making the cost of manufacture cheaper.

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

The boiler A and freezing-pipe E, combined directly with connecting-pipes K L and intermediate forcing-pump G, as and for the purpose described.

THOMAS F. PETERSON.

Witnesses:

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