

(No Model.)

C. C. GERLACH.
REFRIGERATING APPARATUS.

No. 507,729.

Patented Oct. 31, 1893.

Fig. 1.

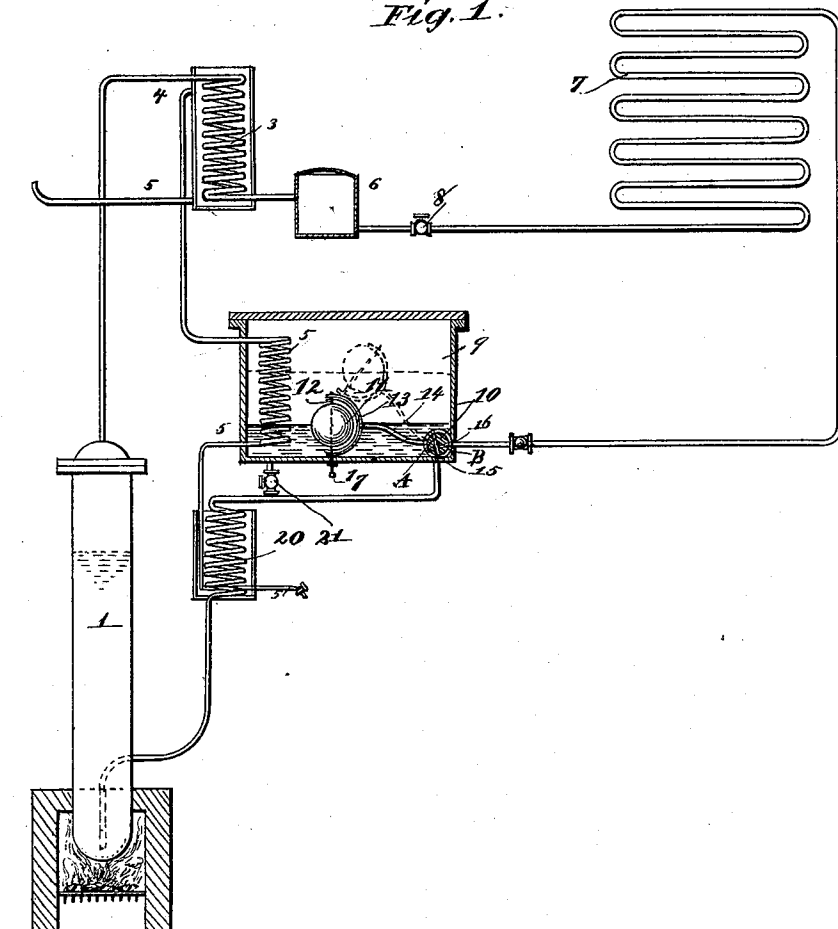


Fig. 2.

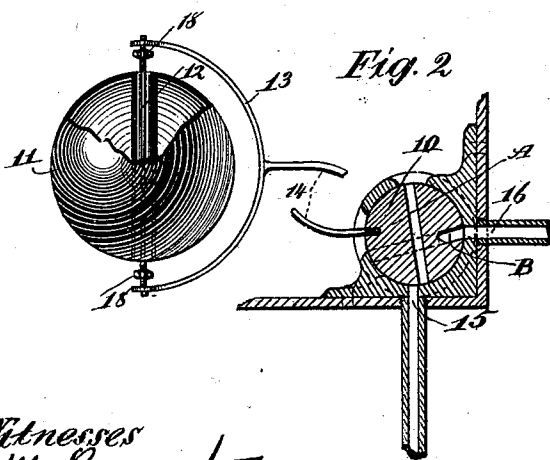
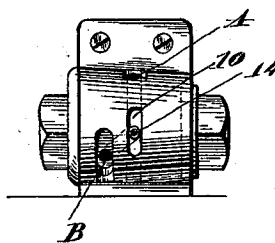


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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REFRIGERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 507,729, dated October 31, 1893.

Application filed December 14, 1892. Serial No. 455,150. (No model.)

To all whom it may concern:

Be it known that I, CARL C. GERLACH, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Refrigerating Apparatus, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in absorption refrigerating apparatus, and its object is to produce an automatic circulation from the retort through the condenser and expansion coils to the absorber and thence with an alternating current to the retort and back to the absorber, without the aid of an intermediate ammonia pump.

My invention consists in the combination and arrangement of parts and construction of details as shown in the accompanying drawings described herein, and more specifically pointed out in the claims.

In the drawings Figure 1 is a vertical elevation in section of my apparatus showing the general arrangement and relative positions of the various parts. Fig. 2 is a detail of duplex valve in transverse section through the ports. Fig. 3 shows a side view of valve or cock.

In the figures 1 is the still or retort filled with aqua ammonia of about twenty-six per cent. strong. Underneath is a heater (as a lamp or steam coil or furnace) for the retort.

3 is a condensing coils surrounded with water circulating through pipes 4 and 5.

6 is the receiver connecting with the expansion coils 7 and separated by valve 8.

9 is the absorbing tank through which the water circulation pipe 5 passes. This tank is located at a higher level than the retort and is provided with the duplex valve 10 provided with the passages A and B connecting with the inlet and outlet openings 15 and 16. The float 11 operates this valve and rests upon the liquid in this chamber. It is mounted upon the spindle 12 within the fork 13 of the valve lever 14, and has limited play vertically therein. Nuts 18 may be employed to regulate the movement of the ball and a bolt 17 is employed to regulate the fall of the lever.

20 is a cooling chamber between the absorber and retort.

21 is a valve opening the connection to the chamber 9 with the retort 1.

The operation of this device is as follows: The contents of the retort are heated until the ammonia gas is liberated and passes into the condenser 3, and thence is collected in the chamber 6 in the form of pure ammonia liquid whence it passes through the valve 8 into the expansion coils 7, which may be placed wherever required. In these coils it again becomes gas and thence it passes into the absorber 9 partially filled with weak liquid, derived from the retort and previously driven thence by the pressure of the ammonia gas liberated therefrom. The gas from the expansion coils is immediately absorbed by the liquid in the chamber 9, the position of the float and valve admitting it freely as shown in Fig. 1, but as the gas is absorbed, the float will rise on its spindle and as soon as the liquid has risen to the determined height the ball will strike the forked lever and close the upper inlet for gas 16, but will open the outlet 15 toward the retort. The pressure being equalized by closing the passage 16, the strong liquor in the absorber will at once fall by gravity into the retort thus renewing the supply, since the absorber is at a higher level than the retort. All the liquid however in the absorber will not be discharged, but enough will remain to absorb the gas entering. It will be seen that the valve 10 will close the lower opening 15 as it falls and again open the upper opening 16. By means of nuts 18, 18 on the spindle 12 the valve can be caused to open or close at any height of liquid required.

In starting the device the valve 8 is closed until considerable pressure accumulates in the retort, when the valve 21 is opened until the pressure admits a sufficient quantity of liquid to the absorber. After this the valve 21 remains closed and the valve 8 open.

It will be seen that I accomplish my object by means of gravity and the natural pressure of the gas.

I believe myself to be the first to introduce automatic mechanism to regulate the circulation in an absorbent refrigerator apparatus without external aid of pumps or injectors.

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

- 2
1. In an absorbent refrigerating apparatus, the combination of a retort, a condenser, a receiver, expansion coils and an absorbing chamber, pipes connecting the several parts
5 in a continuous circuit and a float and two way valve in the absorbing chamber, connecting alternately the inlet and outlet openings in the circulation pipes and absorbing chamber as and for the purpose set forth.
- 10 2. In an absorbent ammonia refrigerating apparatus, the combination of a retort, a condenser, a receiver, expansion coils and absorbent chamber, in combination with circulation pipes connecting the several parts, and float
15 and two way valve in the absorbing chamber connecting with said pipes, whereby the pressure in the retort and absorbing chamber may be equalized and the circulation of gas and liquid regulated automatically, substantially
20 as described.
- In testimony whereof I hereunto set my hand this 1st day of December, 1892.
CARL C. GERLACH.
- Witnesses:
WM. M. MONROE,
WM. L. LEACH.