(No Model.) 2 Sheets—Sheet 1.

W. H. WOOD.

REFRIGERATION AND ICE MACHINE.

No. 346,184. Patented July 27, 1886.

FIG. 1.

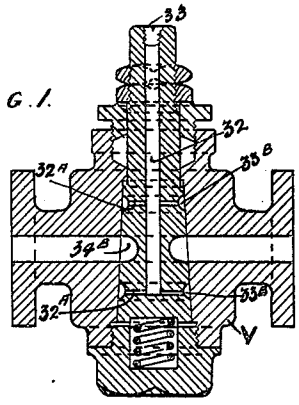


FIG. 2.

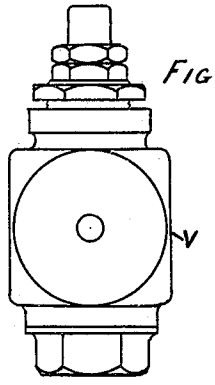


FIG. 3.

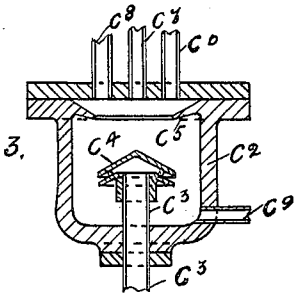


FIG. 4.

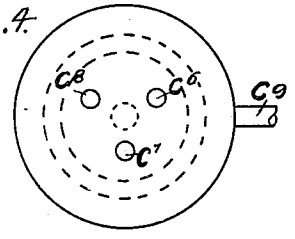


FIG. 5.

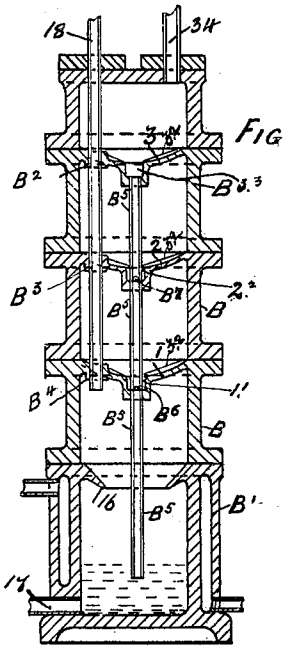


FIG. 6.

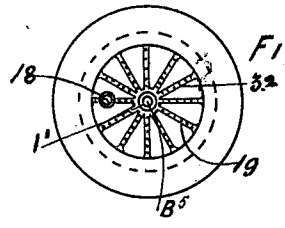
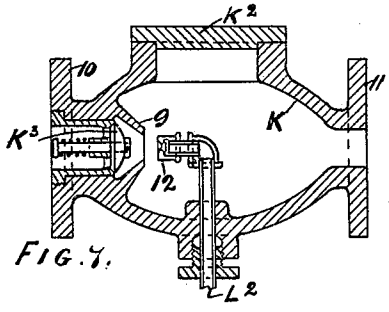


FIG. 7.



WITNESSES:

Thos. Shipley

Wilbur Kelly

INVENTOR

William H. Wood

BY

Wood & Shipley

ATTORNEYS

N. PETERS. Photo-Lithographer, Washington, D. C.

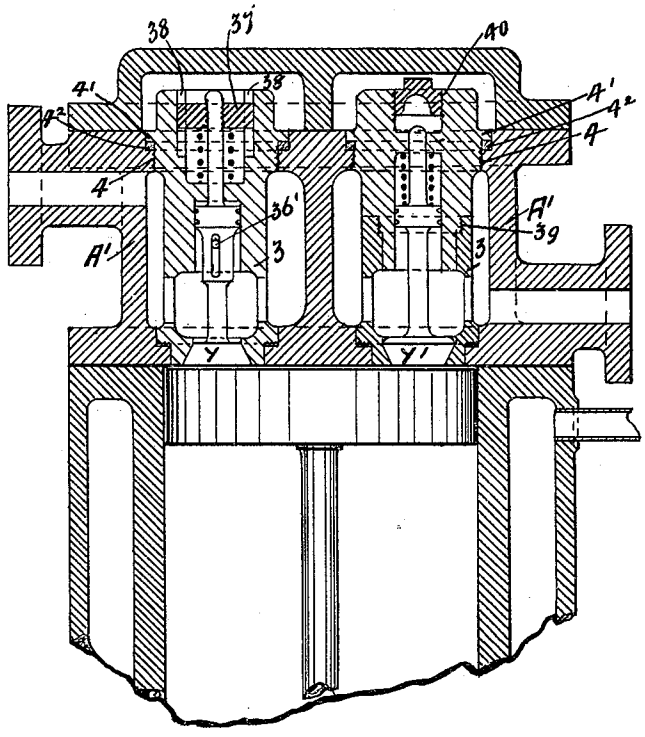
(No Model.) 2 Sheets—Sheet 2.

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FIG. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM H. WOOD, OF NEW YORK, N. Y.

REFRIGERATION AND ICE MACHINE.

SPECIFICATION forming part of Letters Patent No. 346,184, dated July 27, 1886.

Application filed December 21, 1885. Serial No. 186,244. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. WOOD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Refrigeration and Ice Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a sectional drawing of the vapor-cock, showing the vertical hole in center of plug for receiving the sealing-fluid to connect with the grooves around the outside of the plug. Fig. 2 is an end view of the vapor-cock. Fig. 3 is a sectional drawing of the distributing-chamber. Fig. 4 is a plan of same. Fig. 5 is a sectional drawing of the receiver and separator. Fig. 6 is a plan of same. Fig. 7 is a sectional drawing of the diffusing-valve. Fig. 8 is a sectional drawing of valve box, cage, and valves on top of compression-pump cylinder.

Like letters of reference indicate corresponding parts in all the figures.

The nature of my invention, while designed with special reference to the need for the more perfect working of my refrigerating and ice machine, the manner in which the same is or may be carried into practical effect will be understood by reference to United States Patent No. 321,669, granted to myself July 7, 1885, and patent for Great Britain, No. 7,824, granted June 27, 1885, and from the following:

First, the part described as a "diffusion-valve." I have added therein a valve and seating with a spring attached, so that injecting the liquid therein at a higher pressure it will not interfere with the pressure in the refrigerator.

Second, the part described as a "receiver for the gas," for preventing the lubricating-fluid from being carried forward into the condensing-coil, the upper part of which I have made in sections, with the trays cast in each section, and with corrugations for directing the oil to the central cavity, in which a pipe is fastened, and through which it can be carried to the lower part of the receiver.

Third, to the condenser I have attached a distributing-chamber, so that each section of the condenser can have its equal quantity of gas after leaving the receiver, and at the same time it forms a trap for any oil that might by accident be carried over from the receiver.

Fourth, the vapor-cocks for operating one part of the machine. I have a vertical hole in the center of the plug for receiving a sealing-fluid, connecting with grooves outside of the plug, and the gas passes by the side of the plug, making the cock gas-tight.

Fifth, the valves after the equilibrium type for the suction side. I have one nut with projections for working in grooves on each side of the cage to prevent its working loose, and the pin for preventing the valve falling into the cylinder I have put through the piston part of the valve, and the cages for both suction and pressure sides. I have put collars underneath the hexagon part, so that they can be screwed down onto a rubber packing in a recess in the valve-box. I have also made the pressure-valve cage in two parts, for the purpose of inclosing the spring without a thimble. In the top or hexagon part of the cage there is a plug screwed in same, to prevent leakage from the piston part of the valve, and to make it perfectly gas-tight.

Sixth, in the valve-box I have put recesses where the valve-cages are screwed therein to receive rubber packing.

In Fig. 7, K designates the diffusion-valve with the cone-shaped orifice 9 in the center. The atomizing-nozzle 12 is connected to the pipe L^2. The hand-plate K^2 is for adjusting the nozzle, and the valve and seating K^3, with spring attached, is to prevent the pressure in the refrigerator being altered when the liquid at a higher pressure is being injected therein.

In Figs. 5 and 6, B is the receiver and separator in sections, with the concaved trays 1, 2, and 3 cast therein, with the cavities $1' 2^2 3^3$ and the ribs 3^2 on each section radiating to the center, in which the holes 19 are drilled, the ribs forming corrugations in which the oil passing the trays is directed toward the central cavities, $1'$, 2^2, and 3^3, wherein the pipe B^5 is fastened, which fits into each cavity, having grooves B^6 and B^7 cut or filed in same to let the oil pass through the pipe from one cavity to the other until the lower section, B′, is

reached, wherein the oil will remain until drawn off for reusing through the pipe 17. The inlet-pipe 18 fits through the holes in hubs B^2, B^3, and B^4 in the trays of each section, so that all the gas and oil is compelled to be delivered by the pumps into the lower part of the receiver and separator B'. The cone 16, facing toward the bottom of receiver, is for preventing the oil being lifted by the action of the gas, and it is angled from the straight face of the flange of the bottom of the receiver and separator B', and the gas leaves, after passing through the holes in the concaved trays, by the outlet-pipe 34 to the distributing-chamber.

In Figs. 3 and 4, C^2 is the distributing-chamber, designed for receiving the gas after leaving the receiver and separator, the inlet-pipe C^3 projecting some distance through the bottom of distributing-chamber, and on the top of which is fitted a double cone, C^4, so that any oil by accident passing along with the gas will be directed toward the bottom of the chamber by inclination of the cone, and the flange C^5, looking toward the bottom, angling from the flange of C^2, is to prevent any oil being lifted by the action of the gas and following underneath the cover in which are fastened the separate outlet-pipes C^6, C^7, and C^8, by which the gas is admitted to each section of the condenser.

The pipe C^9 is for drawing off any oil that might have been carried over, and it answers for a test-pipe to see if the receiver and separator is working efficiently.

In Fig. 8 the valve-cages are marked 3, and at 4 they are threaded for screwing into the valve-box. At 4' the collars are formed for holding down on the rubber or other packing 4^2 for making a gas-tight joint, and at the top part of the cage the steel pin 36' is fitted to prevent the valve from falling into the cylinder and the nut 37 from working loose. The nut 37 with the projections, is to work in the grooves 38 at each side of the cage 3, instead of nut and lock-nut. The pressure-valve cage is threaded at 39 for screwing together, for inclosing the spring without the thimble, and at the top part it is threaded for the plug 40, which is screwed therein, to prevent leakage from the piston part of the valve Y'. The valve-box A' is recessed at 4^2, for receiving the rubber packing when the valve-cages are screwed into the valve-box.

In Figs. 1 and 2 V designates the vapor-cock with plug 33. The vertical hole 32 is for filling in lubricating fluid, and is made in the center of the plug, and is connected with the grooves 33^B around the plug, forming a seal on the upper and lower part of the plug, at the same time lubricating the plug and making it gas-tight. The gas is allowed to pass around one-half of the plug through the grooves 34^B.

Having now described the improvements made in building my refrigerating and ice machine, I desire to secure by Letters Patent of the United States—

1. In combination with the diffusion-valve chamber K, the valve and seat K^3 with spring, substantially as and for the purpose described and set forth.

2. In combination with a receiver and separator for a refrigerating-machine, the sections B with the pipes B^5, substantially as described, for the purpose set forth.

3. In combination with a refrigeration-machine, the distributing-chamber C^2 with the flange C^5, double cone C^4, the pipe C^9, and the cover for the gas-outlet pipes C^6 C^7 C^8, substantially as described, for the purpose set forth.

4. In combination with a compression-pump, valves, and cages, the collars 4', the steel pin 36', the nut with projections 37, and grooves 38, and the threaded part 39 and 40, substantially as described, for the purpose set forth.

5. In combination with a vapor-cock for operating part of the machine, the vertical hole 32, connecting holes 32^A, and the grooves 33^B, with the half-groove 34^B, forming the passage for the gas, substantially as and for the purpose described and set forth.

6. In combination with a compression-pump valve-box, the recesses 4^2, encircling the threaded part, for receiving the cages, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM H. WOOD.

Witnesses:
HENRY E. KLUGH,
WILLIAM KELLY.