

UNITED STATES PATENT OFFICE.

WILLIAM S. MASON, OF RALEIGH, NORTH CAROLINA.

IMPROVEMENT IN APPARATUS FOR COOLING BUILDINGS AND MAKING ICE.

Specification forming part of Letters Patent No. 104,614, dated June 21, 1870.

To all whom it may concern:

Be it known that I, WILLIAM S. MASON, of the city of Raleigh, in the county of Wake, in the State of North Carolina, have invented a new and improved Mode of Cooling by the Condensation of Atmospheric Air; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and the letters marked thereon.

The nature of the invention consists in the peculiar construction of a receiver for holding and abstracting the heat from condensed atmospheric air, and in the regulator for controlling the use of condensed air for cooling purposes.

The receiver is a cylinder of, say, from ten to fifteen feet in length, and from four to six feet in diameter, and is made of sheet copper or other metal, sufficiently thick to resist the elastic force of any number of volumes of atmospheric air that it may be determined to condense into one. For the purpose of carrying off the excess of heat evolved during the process of condensation, the cylinder is fitted with a large number of flues, B', of any required shape, say of two inches in diameter, extending from end to end, leaving a space in the cylinder above and below not occupied by flues, as shown by a cross-section of the cylinder. (See Fig. 2, letters A and D.)

Cold water is made to flow through these flues to carry off the evolved heat, the cylinder being constructed with boxes, I and L, (see Fig. 1,) for the reception and discharge of the water. The box I has an ice-box, K, for still further reducing the temperature of the water before passing through the flues, in case a more speedy reduction of heat is required, and a stop-cock, M, to let off the water at will afterward. B B are check-valves through which the air, after being condensed by the air-pumps C C, passes into the receiver from below, (see Fig. 1,) and so up and around the flues to the space A, Fig. 2. E E, Fig. 1, are two force-pumps for the purpose of injecting through the tubes F F a stream of cold water into the chambers of the air-pumps C C at the moment of condensation; and M' is a stop-cock to let off any water that may accumulate in the cylinder. At N is attached an air-gage, to indicate the degree of conden-

sation; and O is a pipe for conducting the condensed air to any required locality.

The regulator consists of a metallic rod, U, Fig. 1, one end being attached to some fixed point and the other to a metal lever, T, at a point, V², near a point, V, which is also a fixed point. From the other end of the bar T an adjustable bar, S, extends to one end of a lever, Q, the other end of said lever being attached to a valve, P. The spiral spring R is used to avoid the error occasioned by looseness of joints. The expansion and contraction of the bar U will operate to open and shut the valve upon each wing of which the pressure from within is equally balanced on each side of its center or pivot, the quantity of air to be allowed to pass being regulated by the bar S. The bar U may be of any required length, and be made of brass or of any other metal, or it may be constructed of two bars, one of metal and the other of another metal, of wood, or of glass. When two bars are used, the upper end of one is attached to the point V², and of the other to the point V of the bar T. The bar T and the lever Q are to be made of sufficient length, according to circumstances, to cause a valve, P, to open and shut, upon the expansion and contraction of the bar U, to permit the desired escape of condensed air. Instead of the bar U, a glass tube, W, (Fig. 3,) with a bulb, Y, at the lower end, to be filled with mercury, may be used. A wooden float, at X, resting on the column of mercury, is to be attached to the lower end of the rod Z, the upper end of which is attached to the point V², Fig. 1. The expansion and contraction of the mercurial column answering the purpose of the bar U, in Fig. 1, will move the valve in the same manner; or, two bars of different metal of different expansive power, either soldered or riveted together, may be used, (see Fig. 4;) or, the bar U, Fig. 1, may be made to operate at the point V, the ends of T and U being adapted to each other, and the fixed point or fulcrum being at V². R' may be adjusted above or below, according to circumstances.

Having given a description of the receiver and regulator, I claim—

1. The tubular receiver herein described, with flues and boxes I and L, as set forth.
2. The automatic temperature-regulator

herein described, so arranged that, whenever the temperature in the chamber in which the regulator is situate rises above a given degree, cold air is let in until the temperature is reduced to the required degree, as set forth.

3. The combination of a series of bars, &c., and levers, arranged so as, by their contraction and expansion, to regulate the admission of cold air into a chamber or apartment, as described.

4. The arrangement of the water-flues in the reservoir, in combination with the pump and delivery-tubes, as described.

5. The combination of the receiver or reservoir with automatic regulator, as described.

W. S. MASON.

Witnesses:

J. H. PHILLIPS,

WM. S. MITCHELL.