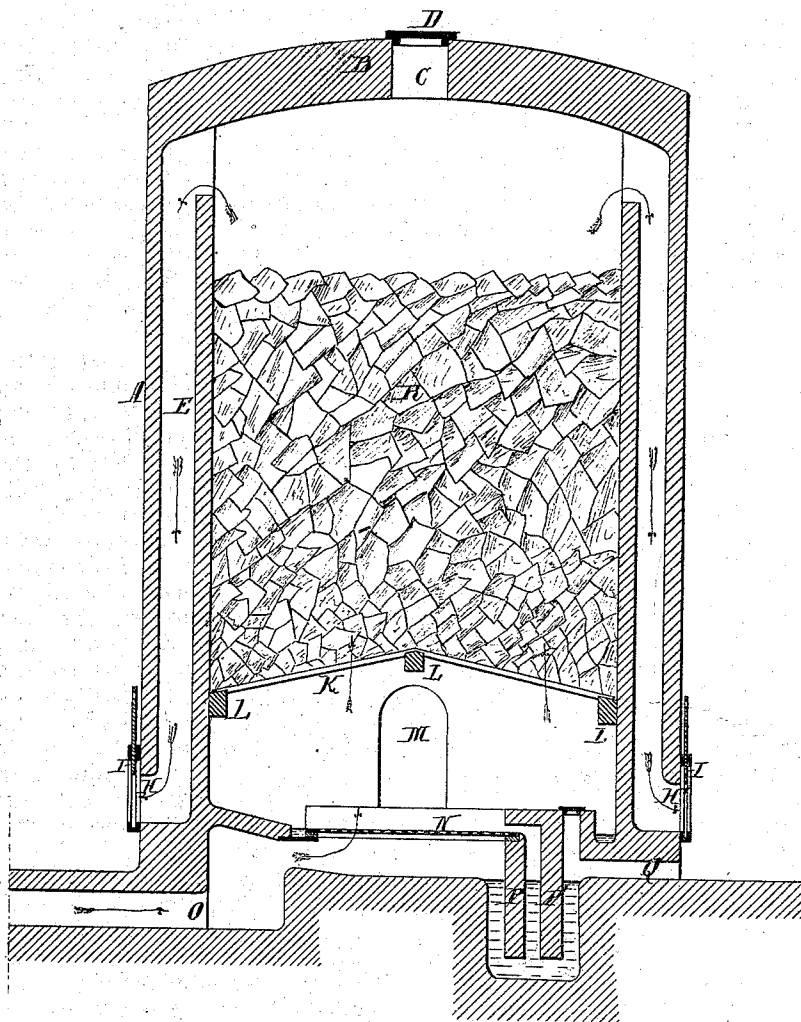


P. NEZERAUX.

Apparatus for Cooling Air.

No. 136,753.

Patented March 11, 1873.



Witnesses.

John K. Rupertus
Harry Smith

P. Nezeroux
By his Atty
Hewson & Son

UNITED STATES PATENT OFFICE.

PLACIDE NÉZERAUX, OF PARIS, FRANCE.

IMPROVEMENT IN APPARATUS FOR COOLING AIR.

Specification forming part of Letters Patent No. 136,753, dated March 11, 1873.

To all whom it may concern:

Be it known that I, PLACIDE NÉZERAUX, engineer, of Paris, France, have invented a Refrigerating Apparatus for Air and Gas, of which the following is a specification:

The main object of this invention is the cooling of rooms used for the manufacture of certain products, such as beer and wines. It is used also during the heat of the summer for cooling the air of hospitals, theaters, restaurants, or other establishments.

Fermentable products, such as the above mentioned, and which serve as drinks, owe their chief quality to a slow fermentation, to produce which the temperature must often be lower than that of the open air. This subject has occupied the attention of many manufacturers, who have proposed different means, but whose results have not been satisfactory. This new apparatus answers in every way the requirements of the case.

Description.

The figure of the annexed drawing represents a vertical section of the refrigerating apparatus, which is composed of a receiver of brick or stone, A, surmounted by an arch, B, in the center of which is a man-hole, C. This opening is hermetically closed by means of the lid D. E E' are two chimneys, built in the walls, and which communicate with the upper part of the receiver, and have openings H H' communicating with the apartments to be cooled. Two registers, I, serve to regulate the size of the openings H H'. K is a grating, formed of iron bars, and resting on or fastened to bearers L. M is a door, which opens into the receiver below the grating, and which closes the entrance hermetically. N is a perfectly smooth copper plate, placed on an iron frame, and perforated with a number of small holes like a sieve. The air, forced either by a ventilator, bellows, or equivalent means, enters by the passage O, and can only pass upward, through the holes of the plate N, to spread itself in the receiver A, whence it escapes through the chimneys and openings H H'. P P' are two suspended partitions, allowing the escape of the water which proceeds from above the plate N, when the apparatus is working, or that falling below the plate when it is at rest. This arrangement permits

the water to be drained off by the exit-passage Q. R is a mass of ice, sustained by the grating K, and filling a large part of the receiver, into which it is introduced through the opening C.

The air which is to be refrigerated is first drawn in, then forced by the bellows through the perforated plate N into the spaces between the ice, by contact with which it becomes refrigerated. From the upper part of the receiver it passes into the chimneys E E', which distribute it through the openings H H' into the rooms or apartments to be cooled.

The water of condensation proceeding from the ice spreads itself over the plate N, and forms a thin layer or film, by passing through which the air is partially cooled, thus economizing ice; and the water after having been thus utilized escapes by the passage Q. This is an important feature of the invention.

If the air of rooms where beer or wines, &c., are kept, or where the fermentation of these products is effected, has to be refrigerated, the passages of the blowing apparatus can be so arranged as to draw in the air of the rooms into which it is to be driven back. The economy of this proceeding will be considerable. It will be indispensable, nevertheless, to sometimes renew the foul air, which can be effected by means of an opening in the air-inlet, and communicating with the outer air; in either case one of the outlets must be shut and the other open.

As to refrigerating the air of hospitals, theaters, and dwelling houses, where the temperature ought to be moderated, it will suffice to have the air blown through the water of wells, or of fountains of which the temperature is low. It is sufficient to have the water continually on the plate N.

By means of the new apparatus air can be obtained of a temperature considerably less than that of the water through which it is blown; it is necessary only to lower according to convenience the registers I I, in such a manner that the air will not pass out except under the influence of a heavy pressure.

The air, in fact, being rewarmed by the condensation in the apparatus, and cooled again by the sheet of water, and always under the same pressure, will lose, when it passes out of the apparatus, a part of its heat. In this case the

ice becomes useless, but the pressure requires a pair of bellows of a relative power.

The partitions P P' ought, when working under pressure, to hang so far down in their trench that the pressure in the interior of the apparatus may be exceeded by that of the column of water resulting from the difference of water-level on both sides of these partitions.

The lowest level ought never to be below the bottoms of these partitions, since that would incur a loss of compressed and unrefrigerated air.

I claim as my invention—

The combination, in a refrigerating or cool-

ing apparatus, of a horizontal perforated plate, a tube or passage for conducting air beneath the plate, and the devices described, or their equivalents, whereby a thin film of water is maintained on the plate, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PLACIDE NÉZERAUX.

Witnesses:

EMILE RICHARD,

EDMOND CHIBAUT.