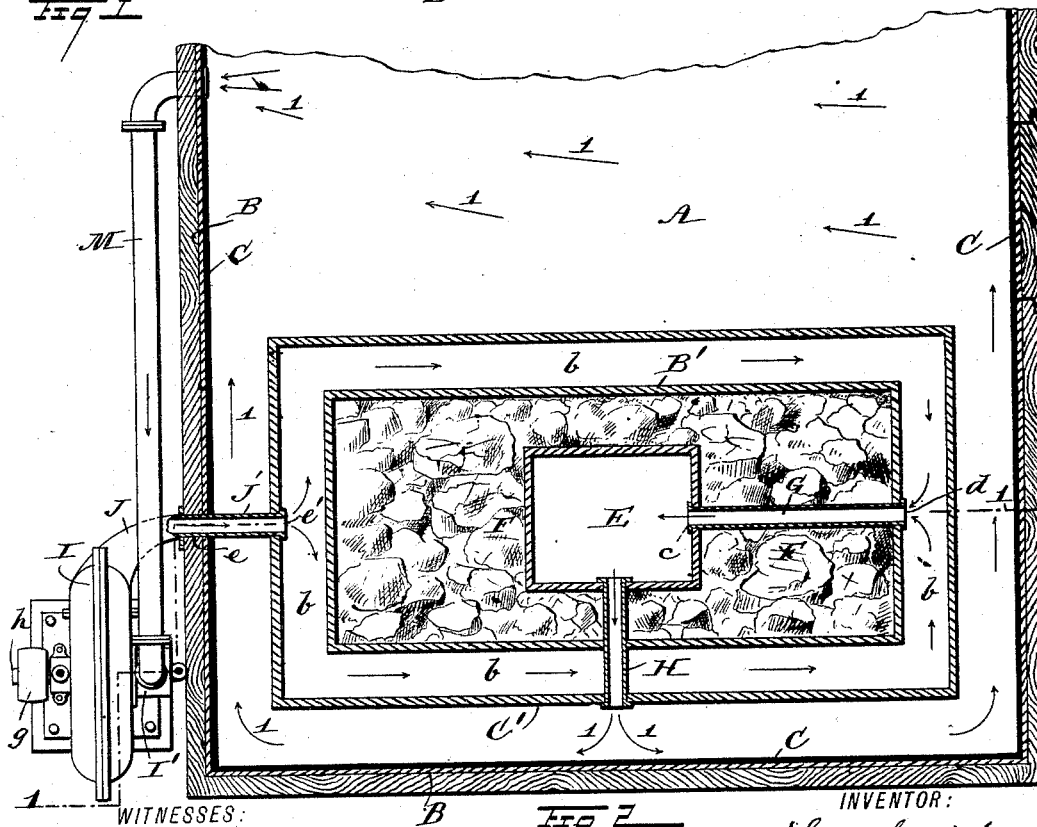
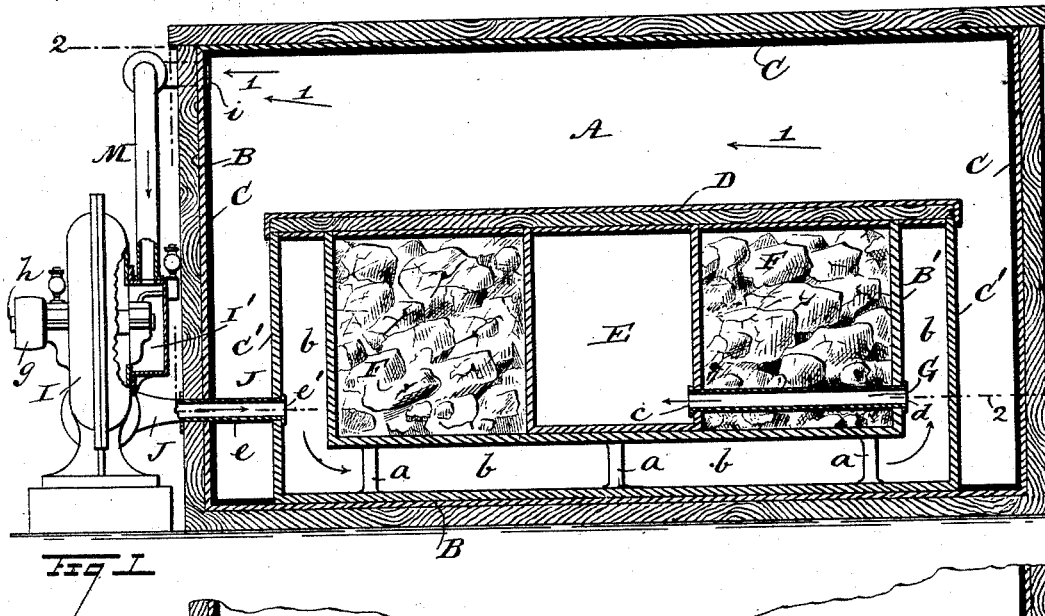


(No Model.)

G. W. SMITH.  
AIR COOLING APPARATUS.

No. 456,444.

Patented July 21, 1891.



WITNESSES:  
H. Walker  
C. Sedgwick

INVENTOR:  
G. W. Smith  
BY Munro & Co  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

GEORGE W. SMITH, OF MOUNT VERNON, ASSIGNOR OF ONE-HALF TO JOHN M. SHINN, OF VELHORM MANOR, NEW YORK.

## AIR-COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 456,444, dated July 21, 1891.

Application filed November 24, 1890. Serial No. 372,435. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. SMITH, of Mount Vernon, in the county of Westchester and State of New York, have invented a new and Improved Apparatus for Refrigeration, of which the following is a full, clear, and exact description.

This invention relates to an improved means for refrigeration, and has for its objects to provide an apparatus whereby the interior air of a sealed chamber used for cold storage may be maintained at a low temperature for the preservation of articles of food and drink.

A further object is to provide a cold-air-producing apparatus which will be economical in consumption of refrigerating material and be reliable in operation.

To these ends my invention consists in the construction and combination of parts in an apparatus which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation in section of a sealed storage-chamber wherein articles to be refrigerated are placed, an ice-receptacle within the storage-chamber, and an air-circulator device in connection therewith, the section being indicated by the broken line 1 1 in Fig. 2; and Fig. 2 is a plan view of a storage-chamber broken and in section, also a sectional plan view of an ice-receptacle in the storage-chamber and a plan view of an air-circulating device in connection with the chamber and receptacle, the line of section being indicated by the broken line 2 2 in Fig. 1.

The chamber A may be of any desired capacity for the cold storage of articles of food of various kinds or malt liquors, and is preferably of rectangular form, having an insulation-B secured upon all its walls and a sheet-metal lining C within, that should be non-corrosive, such as zinc or tin plate; and said chamber should be provided with means of access to its interior, which may be sealed, as is usual in such chambers, there being no claim made for novelty in the form of con-

struction or the provision of a cold-storage room such as has been described.

Within the chamber A a preferably rectangular metallic box B' is located, which has a surrounding wall C' provided on all sides except the cover D, sufficient supports, as at *a*, being furnished to sustain the box above the bottom wall of the outer enveloping wall C, and thus afford a space *b* for air-circulation, the cover D being adapted to seal the box.

Within the ice-box B' a central metallic air-cooling compartment E is placed, so that the ice F when in place within the box B' will completely surround the sides of the compartment and lie against its thin walls. A tubular air-passage G is extended from the interior of the air-compartment E to and through the vertical side wall thereof and of the ice-box B', as at *c d*, whereby a conduit for the transmission of air is afforded between the air-space *b* and air-holding central compartment mentioned. Through another wall of the central air-cooling compartment E a second air-conducting pipe H is inserted, which pipe intersects the outer or surrounding wall C', so that an air-passage is produced between the air-compartment and the storage-chamber A.

At any suitable locality, preferably exterior of the storage-chamber A, an exhausting air-blower I is erected and is connected at the point for air-discharge by an air-conductor pipe J with an air-conducting pipe J', that passes through the wall of the storage-chamber at *e* and thence into the wall C', as at *e'*, to transmit the air forced by the blower I into the air-space *b*, thence into the air-compartment E, and thence into the storage-chamber A.

The fan-blower I is adapted for service by connection of its fan-pulley *g* with any source of power by a belt, (not shown,) and is of a type which is adapted to receive its supply of air through an aperture in one side, the other side being closed, excepting an orifice centrally formed for the introduction of the fan-shaft *h*.

Upon the open side of the fan-blower I an air-supply box I' is secured, that covers the aperture in the side wall of the blower-cas-

ing, as represented in Fig. 1, and from said air-supply box an exhaust-air pipe M is extended to an upper point on the side wall of the storage-chamber A, through which the exhaust-air pipe is introduced, as at *i*, so as to permit the revoluble movement of the blower I to draw air from the upper portion of the storage-chamber.

In use the box B', having been filled with ice and the articles to be refrigerated placed in the storage-chamber A, and said chamber sealed to prevent any introduction of air from without, a revolution of the fan-blower I will draw air from the storage-chamber, as indicated by the arrows 1, which will be forced back through the air-pipe J' into the air-space *b*, and thence into the central air-compartment E, from which it will issue after it has come in contact with the cold walls of said compartment. (Shown by arrows.) The continuous circulation of the air contained in the storage-chamber through the air-passages around and in the ice-box B' speedily reduces its temperature to nearly a freezing-point, which may be maintained with a small percentage of ice consumption if the storage-chamber A is not left open to introduce a great amount of heated external air. The air in the storage-chamber, as it is warmed by contact with fresh articles placed within it, rises to the top and is withdrawn by the exhaustion of the fan-blower, and after circulating for a short time, as has been described, will deposit nearly all the moisture it contains upon the metallic walls of the ice-box B' and air-compartment E, so that the air is rendered dry and preservative, as well as cold, thus conducing to the preservation of

perishable articles of food or drink placed within the storage-chamber.

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

1. A refrigerating apparatus consisting in the storage-chamber, an ice-box therein provided with a central chamber E and an outer surrounding wall C', spaced to form the passage *b*, a pipe or passage G, connecting the chamber E and space *b*, a pipe or passage H, connecting the chamber E with the interior of the storage-chamber, and a blower for exhausting air from the storage-chamber and returning it to the space *b*, substantially as set forth.

2. A refrigerating apparatus consisting in the storage-chamber A, an ice-box B' within the said chamber and having a central chamber E, a wall C', surrounding the ice-box and spaced from the sides, ends, and bottom of the box to form the air-space *b*, a cover D, closing the top of the box, the chamber, and the space *b*, a pipe or passage G, leading from the space *b* into the chamber E, a pipe H, connecting the chamber E with the interior of the storage-chamber, a pipe or passage J', leading from the exterior of the storage-chamber into the space *b*, a pipe *i*, leading from the upper end of the storage-chamber outward, and a rotary blower or pump connected with the pipes *i* J' and exhausting the air through the former and returning it through the latter pipe, substantially as set forth.

GEORGE W. SMITH.

Witnesses:

THOMAS W. FALLON,  
BENJ. BROWN.