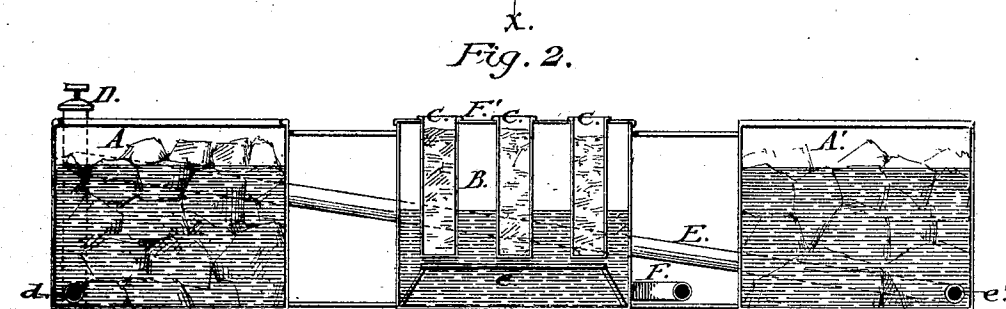
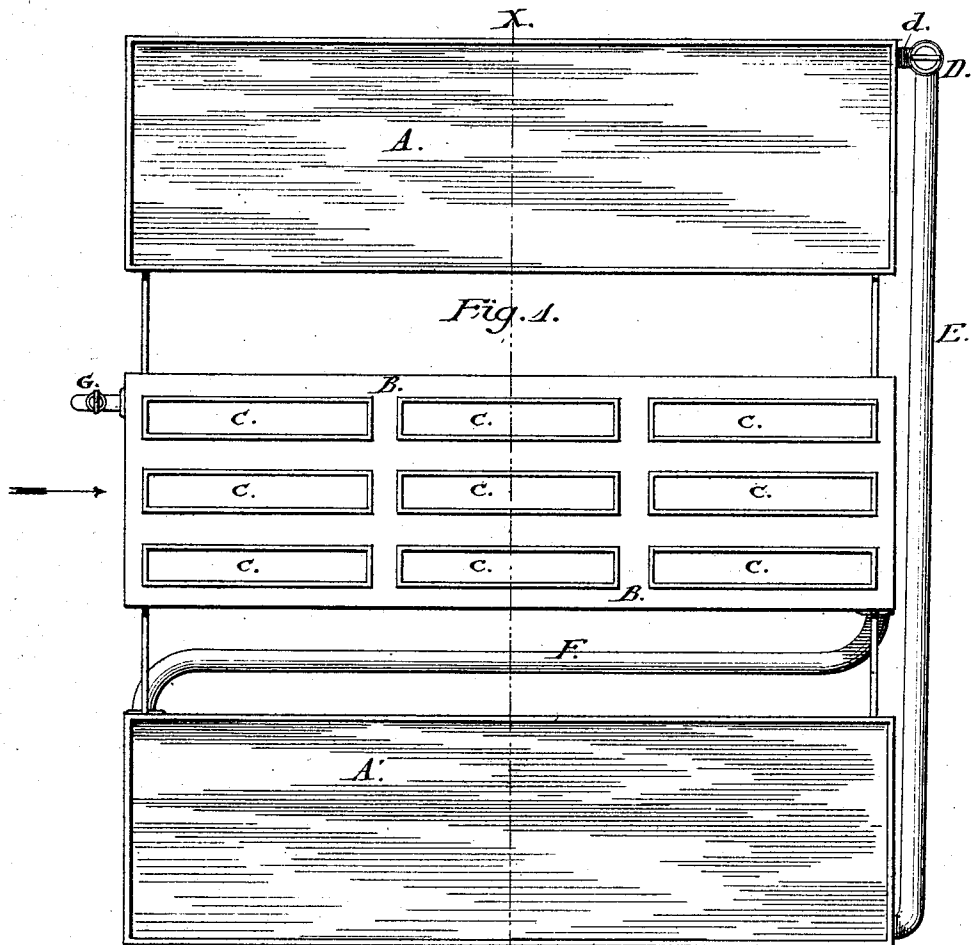


T. D. KINGAN.
Apparatus for Cooling Air and Making Ice.
 No. 145,659. Patented Dec. 16, 1873.



Witnesses:
 Edw. W. Dunn
 Myrdner.

Inventor:
 Thomas D. Kingan.
 per C. E. McDonald
 Atty.

UNITED STATES PATENT OFFICE

THOMAS D. KINGAN, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN APPARATUS FOR COOLING AIR AND MAKING ICE.

Specification forming part of Letters Patent No. **145,659**, dated December 16, 1873; application filed December 2, 1873.

To all whom it may concern:

Be it known that I, THOMAS D. KINGAN, of the city of Indianapolis, county of Marion, in State of Indiana, have invented an Improvement in Refrigerators, of which the following is a specification:

The nature of the invention consists in an improvement of the patent for an improvement in refrigerators, which was granted to me on the 1st day of July, 1873, which will be fully understood by the following general description and the accompanying drawings.

Figure 1 of the accompanying drawings is a top view of the device. Fig. 2 is a sectional view of the same through the dotted line *x x* of Fig. 1.

A and A' are two refrigerators, of the kind for which a patent was granted to me on the 29th day of April, 1873. They may be of any convenient size, and are, as is shown in Fig. 2, to be packed with ice and salt, for the purpose of producing cold, as set forth and described in my said patent of April 29, 1873. Between these refrigerators A and A' is placed the rectangular trough or box B, as shown in the drawing, which may be of any convenient size. D is a pump, which communicates with the refrigerator A by means of the tube *d*, and also with the refrigerator A' by means of the tube E. This refrigerator A' is connected with the box or trough B by means of the tube F. The contents of the box or trough B may be discharged through the faucet G. On the top of the box or trough B is placed the rack or frame F', which consists of a series of parallel slats or members, joined together by cross-pieces, and having convenient interstices between them. Inside of the box or trough B, on the bottom, is placed the racks or frame *e*, constructed and arranged like the frame or rack F', but so that its members will be directly below the interstices between the members of the rack or frame F' at the top. In the interstices of the rack or frame F', and resting upon the members of the rack or frame *e*, are to be placed a series of rectangular water-vessels, represented by C, C, and C. These vessels are to hold fresh water, which, as will be presently shown, is to be frozen into ice. As soon as the ice and

salt, with which the refrigerators A and A' are to be packed, come together, they will begin to melt and run down into the bottom of the refrigerator in the form of brine. This will continue until all the ice and salt in the refrigerator has been melted. Thus it will require but comparatively a short space of time to fill the refrigerator with brine. As long as any considerable quantity of ice remains the brine will be intensely cold, but when the ice is all melted it will soon become so warm that it will be of no further use for cooling purposes. When the refrigerators are full of brine there will be no room for ice. On this account it becomes (as actual experiment has shown) frequently necessary to withdraw large quantities of brine from the refrigerator while it is still very cold. To utilize the coldness of this brine, which must necessarily be withdrawn from the refrigerators, the improvement herein described has been devised. It is used as follows: The vessels C, C, and C having been filled with fresh water and placed in their proper places, and all the other parts of the device being arranged as shown in the drawing, the operator begins to work the pump D. This withdraws brine from the refrigerator A, and empties it into the refrigerator A', from whence, passing through the tube F, it will be conducted into the box or trough B, and, rising around the water-vessels C, C, and C, quickly freezes the water in them into solid ice. When the brine has risen high enough in the box or trough B, the stop-cock G may be opened enough for the brine to run out as fast as it runs in at F. In this way a constant current of intensely cold brine may be kept flowing through the trough or box B until the supply is exhausted. It will be found, by actual experiment, that the temperature of the brine coming from the refrigerator A will be reduced many degrees in passing through the refrigerator A'. As fast as the water in the vessels C, C, and C is frozen, they may be replaced with similar vessels filled with fresh water, and so the freezing process be continued until the supply of brine is exhausted. Large quantities of ice, involving a great expense, are constantly required to keep the refrigerators A and A' properly charged,

but in this way a considerable part of the ice required is furnished at merely a nominal expense.

I claim as an improvement to my said patent of July 1, 1873—

1. The arrangement of the refrigerator A, the tube *d*, the pump D, the tube E, the refrigerator A', and the tube F, whereby the brine from the said refrigerator A is compelled to pass through the refrigerator A' before entering the box B, and whereby the temperature of the brine is greatly reduced before entering the box or trough B.

2. The combination and arrangement of the

refrigerator A and the tube *d*, the pump D, the tube E, the refrigerator A, the tube F, the box or trough B, with its racks or frames F' and *e* and water-vessels C, constructed and arranged substantially as set forth, and the stop-cock G, all for the purpose, and in the way, substantially as set forth.

In testimony that I claim the foregoing specification, I have hereunto set my hand this 24th day of November, 1873.

THOMAS D. KINGAN.

Attest:

FRED. WERBE,

F. M. McDONALD.