

(No Model.)

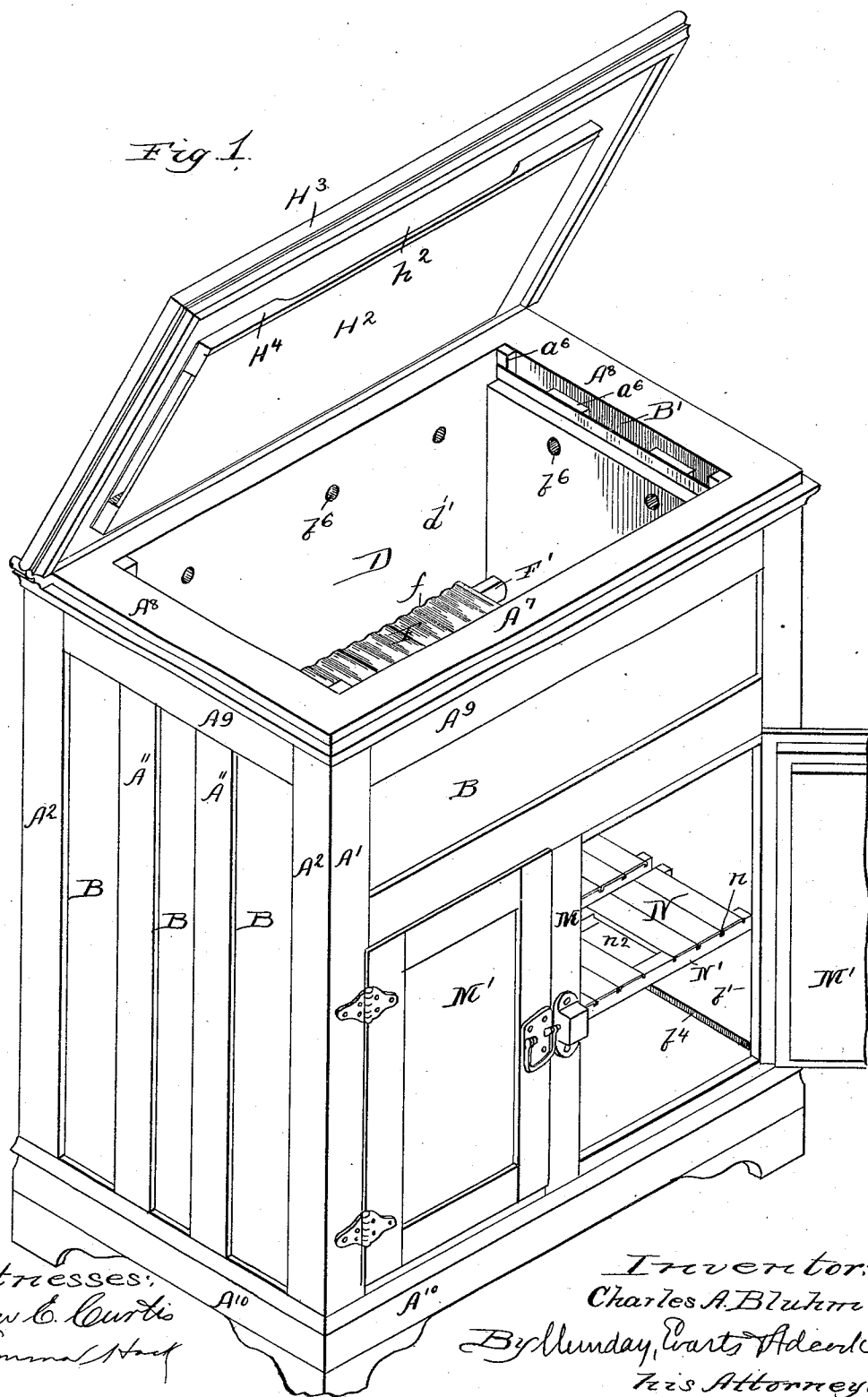
3 Sheets—Sheet 1.

C. A. BLUHM.  
REFRIGERATOR.

No. 478,080.

Patented July 5, 1892.

Fig 1.

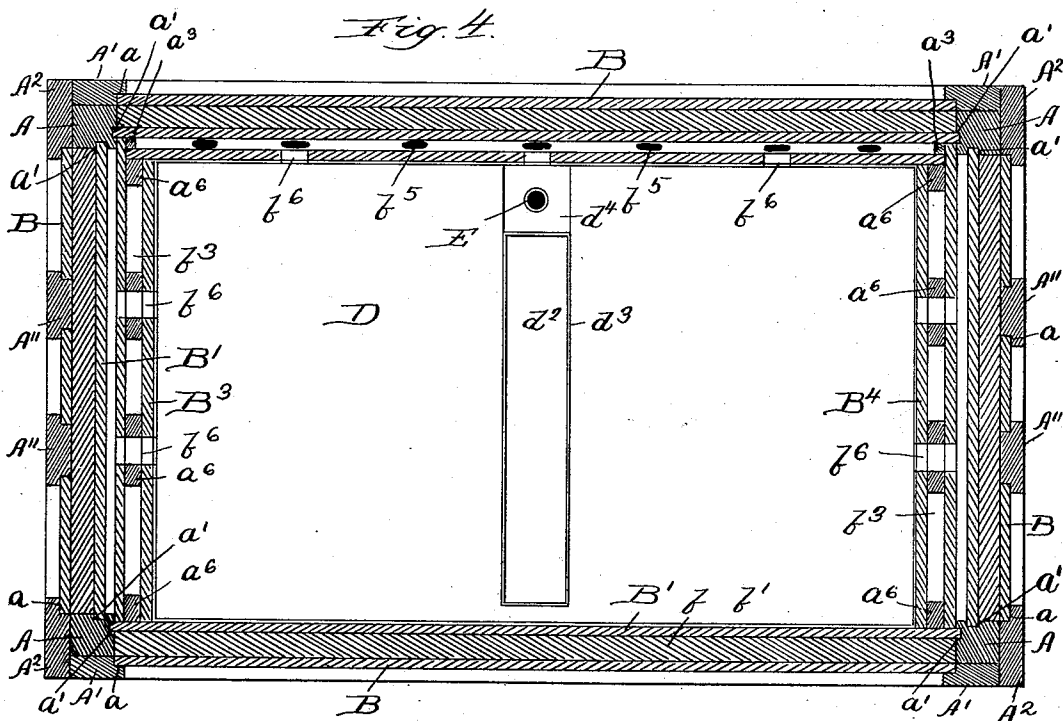
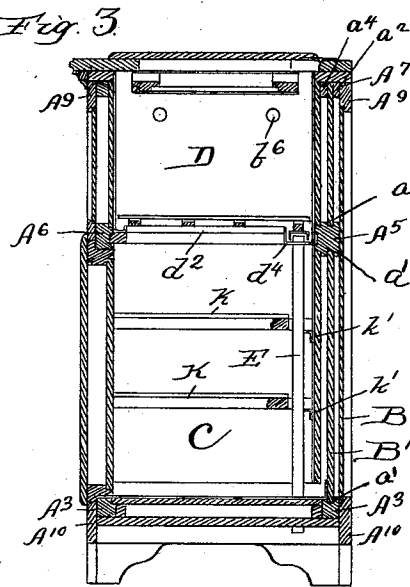
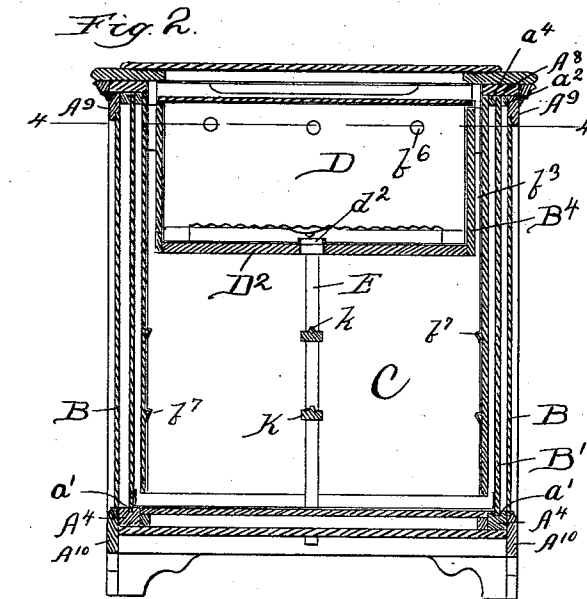


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No. 478,080..

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# UNITED STATES PATENT OFFICE.

CHARLES A. BLUHM, OF MICHIGAN CITY, INDIANA.

## REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 478,080, dated July 5, 1892.

Application filed March 21, 1892. Serial No. 425,653. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. BLUHM, a citizen of the United States, residing at Michigan City, in the county of La Porte and State of Indiana, have invented a new and useful Improvement in Refrigerators, of which the following is a specification.

My invention relates to improvements in refrigerators.

The object of my invention is to provide an efficient and economical refrigerator for household and other uses which will be durable and readily kept clean and sweet and which is simple and may be economically manufactured.

The leading features of novelty embodied in the construction of my new refrigerator are, first, two independent systems or means of air-circulation from the provision-chamber back to the ice-chamber, one taking the air from the top portion of the provision-chamber and leading from underneath the ice tank or chamber and the other taking the air from the bottom of the provision-chamber; second, means for delivering the air from the bottom of the provision-chamber into the ice-chamber at the end thereof and for delivering the air taken from the top of the provision-chamber into the ice-chamber at the front and back of the ice-chamber through an opening in the cover; third, the particular construction and arrangement of the ice-rack and providing the same with drip-ridges over the central opening underneath the same; fourth, the novel construction of the water-seal, the same being formed partly in the ice-chamber and partly on the under side of the removable ice-rack, so that when the ice-rack is removed the drip-pipe is left free and open and undisturbed by the water seal, this being a convenience and economy in construction and also a matter of convenience in cleaning and repairing the refrigerator; fifth, providing the bottom of the ice-chamber with an opening for the passage of the air down through the same into the provision-chamber, said opening being surrounded by a raised rim or flange to prevent the water collecting on the bottom of the provision-chamber from flowing through said opening in connection with the drip ridges or trough on the bottom of the ice-rack and above said air-passage

opening, so that the drip can flow into the water seal at the end of said air-passage opening; sixth, the construction of the cover whereby it is adapted to receive air at its ends from the air-passage leading underneath the ice-chamber and deliver the air into the ice-chamber at or through the front and rear openings in said cover; seventh, the construction of the provision-racks of wooden rails furnished with saw-cuts or grooves on their upper faces and sheet-metal slats having their edges turned down to form right-angle flanges, which fit in said saw-cuts or grooves in the side rails.

My invention consists in the novel construction and combinations of parts and devices embodied in the refrigerator herein shown and described.

In the accompanying drawings, forming a part of this specification, Figure 1 is a perspective view of my improved refrigerator. Fig. 2 is a central vertical longitudinal section. Fig. 3 is a central vertical cross-section. Fig. 4 is an enlarged horizontal section taken on the line 4 4 of Fig. 2. Fig. 5 is an enlargement of the upper portion of Fig. 3. Fig. 6 is an enlargement of part of Fig. 2. Fig. 7 is a detail perspective of one of the provision-racks. Fig. 8 is an enlarged detail section across the air-passage opening in the bottom of the provision-chamber.

In the drawings similar letters of reference indicate like parts in all the figures.

In the drawings the frame is shown to be composed of four upright posts A, each covered by outer upright casings A' A<sup>2</sup>, the horizontal side and end sills A<sup>3</sup> A<sup>4</sup>, and the intermediate side bars A<sup>5</sup> A<sup>6</sup>, which latter form the support for the ice-chamber, and the upper horizontal frame-bars A<sup>7</sup> A<sup>8</sup>, and the upper and lower horizontal casings A<sup>9</sup> A<sup>10</sup>. The upright casings A<sup>11</sup> at each end of the refrigerator may also be considered as constituting a part of the frame.

B represents the outer wall of the refrigerator, the same being preferably of wood and nailed or secured to the upright casings A', A<sup>2</sup>, and A<sup>11</sup> and the horizontal casings A<sup>9</sup> A<sup>10</sup>, said casings having shoulders a to receive the boards forming said wall.

B' is the second wall of the refrigerator, the same being preferably of wood and se-

cured to the upright posts A, horizontal sills or frame-pieces A<sup>3</sup> A<sup>4</sup> A<sup>5</sup> A<sup>6</sup>, said sill-posts and frame-pieces having grooves a' to receive the boards of this second wall and leave a space between the same and said outer wall B to receive the non-conducting filling b, preferably of charcoal.

At the front side of the refrigerator the second wall B' constitutes the inner wall of the refrigerator and is furnished with the inner sheet-metal lining b'. At the top the walls B and B' are separated by the furring-strips a<sup>2</sup>, which are secured to the upper frame-pieces A<sup>3</sup> A<sup>4</sup> and to the horizontal casings A<sup>9</sup>.

B<sup>2</sup> is the third wall of the refrigerator, the same being secured at the ends to the upright posts A and at the back to the upright furring-strips a<sup>3</sup> and horizontal furring-strips a<sup>4</sup> and the horizontal side bars A<sup>5</sup>, which are furnished with shoulders or grooves a<sup>5</sup> to receive the same. An air space or passage b<sup>2</sup> is left between this wall B<sup>2</sup> and the second wall B' at the back and ends of the refrigerator. This third wall B<sup>2</sup> constitutes the inner wall of the refrigerator and at the back and ends is furnished with the sheet-metal lining b'.

C is the provision-chamber, and D is the ice-chamber above the provision-chamber. At the back and front sides the walls of the ice-chamber are formed by said walls B' B<sup>2</sup>; but at the ends of the ice-chamber it has independent upright walls B<sup>4</sup>, separated from the walls B<sup>2</sup> by upright furring-a<sup>6</sup>, which forms an air-passage b<sup>3</sup> between said walls B<sup>4</sup> and B<sup>2</sup>. The bottom D<sup>2</sup> of the ice-chamber is supported on the side bars A<sup>5</sup> A<sup>6</sup>, which are furnished with grooves a<sup>7</sup> on their inner side to receive the bottom D<sup>2</sup>. The ice-chamber bottom D<sup>2</sup> is furnished with a sheet-metal lining d' on its inner side, having an air-passage opening d<sup>2</sup>, surrounded by a vertical flange or rim d<sup>3</sup> to prevent the water collecting in the bottom of the ice-chamber from flowing through said opening into the provision-chamber below. The air-passage opening d<sup>2</sup> extends, also, through the bottom D<sup>2</sup> of the ice-chamber, and it is preferably a long narrow opening located about midway of the refrigerator and extending across the same. The bottom D<sup>2</sup> of the refrigerator or its lining d<sup>2</sup> is furnished with a cup, depression, or recess d<sup>4</sup> to form the fixed or immovable part of the water seal, the end of the drip-pipe E projecting up through the bottom of this cup. This cup or water seal d<sup>4</sup> is preferably located at the end of the air-passage opening d<sup>2</sup>, so that the inclined drip-ridge on the under side of the ice-rack, and which extends over the air-passage opening d<sup>2</sup> to protect the same from drip, may deliver the water collecting thereon or therein directly into the well or cup d<sup>4</sup> of the water seal.

F is the ice rack or pan formed, preferably, of corrugated sheet metal, the corrugations f extending parallel to the air-passage opening d<sup>2</sup>. The ice-pan F is supported above the bot-

tom of the ice-chamber D<sup>2</sup> by the longitudinal bars F' of the ice-rack, so as to leave an air space or passage d<sup>5</sup> between the same and the bottom of the ice-chamber communicating with the central air-passage opening d<sup>2</sup>.

f' is the inclined drip-ridge underneath the ice-rack and extending over the air-passage opening d<sup>2</sup>. The saddle for this inclined drip-ridge is preferably furnished with a supplemental notch f<sup>2</sup> for the water to pass through. The drip-ridges fit in saddles f<sup>3</sup>, formed in the slats or bars F'. The longitudinal slats or bars F' of the ice-rack are also furnished with notches f<sup>4</sup> to receive the upright rim or flange d<sup>3</sup>, surrounding the air-passage opening d<sup>2</sup>, as is more clearly shown in Fig. 8.

Secured to the movable ice-rack F or to one of the bars F' is an inverted cup d<sup>6</sup>, which fits in the well or cup d<sup>4</sup> and over the projecting end of the drip-pipe E, so as to form the other or removable part of the water seal.

The bottom or floor of the refrigerator has an outer wall G and an inner wall G', separated by furring-strips g, the space between being filled with a non-conducting material g', and is provided with an inner sheet-metal lining g<sup>2</sup>.

The inner wall B<sup>2</sup> of the refrigerator at its back, side, and ends does not extend down quite to the floor, so as to leave an air space or passage b<sup>4</sup> between the lower edge of this wall B<sup>2</sup> and the floor, and through which air passage or opening the air-passage b<sup>2</sup> communicates with the provision-chamber C at the bottom thereof. As the horizontal side bar A<sup>5</sup> would form an obstruction in the air-passage b<sup>2</sup> at the back side of the refrigerator, I furnish said side bar A<sup>5</sup> with air-passages b<sup>5</sup> through the same, which thus form a continuation of the air space or passage b<sup>2</sup>.

The air taken from the bottom of the provision-chamber C through the air-passage b<sup>4</sup> b<sup>2</sup> is delivered into the ice-chamber D through openings or air-passages b<sup>6</sup>. At the ends of the refrigerator these openings or air-passages b<sup>6</sup> are formed in or through the wall B<sup>2</sup>, the furring-strips a<sup>6</sup>, and the end walls B<sup>4</sup> of the ice-chamber. These openings or air-passages b<sup>6</sup> are located at or formed in or through the furring-strips a<sup>6</sup>, so that said furring-strips will thus prevent any communication between the continuous air-passage b<sup>4</sup> b<sup>2</sup> b<sup>6</sup> and the other and independent air-passage b<sup>3</sup>, which leads from the top of the provision-chamber and just underneath the bottom of the ice-chamber.

It will be understood that the openings or air-passages b<sup>6</sup>, which lead into the ice-chamber from the air-passage b<sup>2</sup> at the back side of the refrigerator, are formed in and extend only through the wall B<sup>2</sup>.

The cover H is secured by hinges h to the top molding plate or strip A<sup>12</sup> and has an outer wall H' and an inner wall H<sup>2</sup>, separated from each other by the casing or marginal frame-plates H<sup>3</sup> and H<sup>4</sup> of the cover.

The air space or passage b<sup>3</sup>, leading from

the top of the provision-chamber underneath the bottom of the ice-chamber at the two ends of the refrigerator, communicate with the air space or passage  $h'$  between the outer and inner walls of the cover, and which air-passage  $h'$  leads into the ice-chamber D at the top thereof through the openings  $h^2$  at the front and back sides of the refrigerator, said openings being formed by partially cutting away the furring or frame strips  $H^4$  of the cover.

The sheet-metal lining  $b'$  of the provision-chamber at the ends thereof is furnished with internal projections or ribs  $b'$ , preferably formed by simple folds or corrugations in said sheet-metal lining to form supports or ledges upon which to rest the provision-racks. Intermediate supports for the provision-trays are formed by cross-bars K, having a rib  $k$ , and which rest at the back on shoulders  $k'$ , attached to the inner wall of the refrigerator, and which at the front are secured to the upright post M of the door-frame. The provision racks or trays N each comprise two wooden rails  $N'$ , furnished with cross-grooves or saw-cuts  $n$  to receive the flanges  $n'$  of the sheet-metal slats  $N^2$ . These flanged sheet-metal slats should also be tacked to the rails  $N'$ . An opening or air-passage  $n^2$  is formed in the middle of each provision-tray by omitting one of the slats  $N^2$ . This opening or air-passage  $n^2$  permits the cold air from the ice-chamber to descend freely and centrally through the provision-chamber C.

The doors  $M'$  are or may be of any suitable construction and need no detailed description to enable them to be constructed by those skilled in the art.

I claim—

1. In a refrigerator, the combination, with a provision-chamber and an ice-chamber above said provision-chamber, of two independent systems of or passages for air-circulation, one leading from the top portion of the provision-chamber into the ice-chamber and the other leading from the bottom portion of the provision-chamber into the ice-chamber, substantially as specified.

2. In a refrigerator, the combination, with a provision-chamber and an ice-chamber above said provision-chamber, of two independent systems of or passages for air-circulation, one leading from the top portion of the provision-chamber into the ice-chamber and the other leading from the bottom portion of the provision-chamber into the ice-chamber, said ice-chamber having a central air passage or opening through its bottom, substantially as specified.

3. In a refrigerator having first and second walls with a non-conducting filling or packing between and an inner third wall with an air space or passage between the same and said second wall, a provision-chamber, and an ice-chamber above said provision-chamber, having a fourth or additional wall at its ends with an air space or passage between the same and said third wall of the refrigerator,

said first-mentioned air space or passage communicating with the provision-chamber at its bottom and leading into the ice-chamber and said second-mentioned air space or passage communicating with the provision-chamber at its top and leading into said ice chamber, substantially as specified.

4. In a refrigerator having first and second walls with a non-conducting filling or packing between and an inner third wall with an air space or passage between the same and said second wall, a provision-chamber, and an ice-chamber above said provision-chamber and having a fourth or additional wall at its ends with an air space or passage between the same and said third wall of the refrigerator, said first-mentioned air space or passage communicating with the provision-chamber at its bottom and leading into the ice-chamber and said second-mentioned air space or passage communicating with the provision-chamber at its top and leading into said ice-chamber, said third wall of the refrigerator having an opening or air passage  $b^4$  at its lower edge between the same and the floor, substantially as specified.

5. In a refrigerator having first and second walls with a non-conducting filling or packing between and an inner third wall with an air space or passage between the same and said second wall, a provision-chamber, and an ice-chamber above said provision-chamber and having a fourth or additional wall at its ends with an air space or passage between the same and said third wall of the refrigerator, said first-mentioned air space or passage communicating with the provision-chamber at its bottom and leading into the ice-chamber and said second-mentioned air space or passage communicating with the provision-chamber at its top and leading into said ice-chamber, said third wall of the refrigerator having an opening or air-passage  $b^4$  at its lower edge between the same and the floor and leading into the ice-chamber through openings  $b^6$ , extending through said third wall  $B^2$ , said fourth wall  $B^4$ , and an intermediate furring strip or block  $a^6$ , substantially as specified.

6. In a refrigerator having first and second walls with a non-conducting filling or packing between and an inner third wall with an air space or passage between the same and said second wall, a provision-chamber, and an ice-chamber above said provision-chamber and having a fourth or additional wall at its ends with an air space or passage between the same and said third wall of the refrigerator, said first-mentioned air space or passage communicating with the provision-chamber at its bottom and leading into the ice-chamber and said second-mentioned air space or passage communicating with the provision-chamber at its top and leading into said ice-chamber, said last-mentioned air-passage  $b^3$  leading into the ice-chamber through an air space or passage  $b'$  in the cover, substantially as specified.

7. In a refrigerator having first and second walls with a non-conducting filling or packing between and an inner third wall with an air space or passage between the same and said second wall, a provision-chamber, and an ice-chamber above said provision-chamber and having a fourth or additional wall at its ends with an air space or passage between the same and said third wall of the refrigerator, said first-mentioned air space or passage communicating with the provision-chamber at its bottom and leading into the ice-chamber and said second-mentioned air space or passage communicating with the provision-chamber at its top and leading into said ice-chamber, said first-mentioned air space or passage  $b^2$  leading into the ice-chamber at the ends and back side thereof through openings  $b^6$  in the vertical walls of the ice-chamber, and said last-mentioned air space or passage  $b^3$  leading into the ice-chamber at the top and front side thereof through an air space or passage in the cover, substantially as specified.
8. In a refrigerator, the combination, with a provision-chamber and an ice-chamber above said provision-chamber, of two independent systems of or passages for air-circulation, one leading from the top portion of the provision-chamber into the ice-chamber and the other leading from the bottom portion of the provision-chamber into the ice-chamber, said last-mentioned air-passage leading into the ice-chamber through openings in the vertical walls thereof at the ends and back side, substantially as specified.
9. In a refrigerator, the combination, with a provision-chamber and an ice-chamber above said provision-chamber, of two independent systems of or passages for air-circulation, one leading from the top portion of the provision-chamber into the ice-chamber and the other leading from the bottom portion of the provision-chamber into the ice-chamber, said first-mentioned air-passage leading into the ice-chamber at the front side thereof through an air space or passage in the cover of the refrigerator, substantially as specified.
10. In a refrigerator having an ice-chamber and an ice-rack in said chamber and a drip-pipe extending from said chamber, a water seal consisting of a depression, recess, or cup  $d^4$  in the bottom of the ice-chamber, and an inverted cup  $d^6$ , attached to the ice-rack, substantially as specified.
11. In a refrigerator, the combination, with the provision-chamber, of an ice-chamber D above the same, having bottom  $D^2$ , furnished with sheet-metal lining  $d'$ , and an air-passage opening  $d^2$  through said bottom  $D^2$ , said lin-

ing  $d'$  having an upturned flange or rim  $d^3$ , 60 surrounding said opening, and an ice tank or pan F, having corrugations  $f$ , extending parallel to said air-passage opening  $d^2$ , substantially as specified.

12. In a refrigerator, the combination, with the provision-chamber, of an ice-chamber D above the same, having bottom  $D^2$ , furnished with sheet-metal lining  $d'$ , and an air-passage opening  $d^2$  through said bottom  $D^2$ , said lining  $d'$  having an upturned flange or rim  $d^3$ , 70 surrounding said opening, and an ice tank or pan F, having corrugations  $f$ , extending parallel to said air-passage opening  $d^2$ , and a drip-ridge  $f'$ , extending underneath said ice-pan and over said air-passage opening  $d^2$ , substantially as specified. 75

13. In a refrigerator, the combination, with the provision-chamber, of an ice-chamber D above the same, having bottom  $D^2$ , furnished with sheet-metal lining  $d'$ , and an air-passage opening  $d^2$  through said bottom  $D^2$ , said lining  $d'$  having an upturned flange or rim  $d^3$ , 80 surrounding said opening, and an ice tank or pan F, having corrugations  $f$ , extending parallel to said air-passage opening  $d^2$ , and a drip-ridge  $f'$ , extending underneath said ice-pan and over said air-passage opening  $d^2$ , and a water seal, depression, or cup  $d^4$ , formed in the bottom of said ice-chamber at the end of said air-passage opening  $d^2$ , substantially as specified. 90

14. In a refrigerator, the combination, with the provision-chamber thereof, of provision racks or trays N, having rails  $N'$ , furnished with cross-grooves  $n$ , and metal slats  $N^2$ , having flanges  $n'$ , fitting in said cross-grooves, said racks having air-passage openings  $n^2$  through the same, substantially as specified. 95

15. The provision rack or tray for refrigerators, consisting in a pair of wooden rails  $N'$ , 100 furnished with cross-grooves  $n$  in their upper faces, and metal slats  $N^2$ , having flanges or turned edges  $n'$ , fitting in said cross-grooves  $n$ , substantially as specified.

16. In a refrigerator, the combination, with the walls B B', having non-conducting filling  $b$  between, of a third wall  $B^2$ , having an air-space  $b^2$  between it and said wall B', an intermediate side frame-piece  $A^5$ , having openings  $b^5$  through the same, and a provision-chamber and ice-chamber, both communicating with said air-passage  $b^2$ , substantially as specified. 110

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