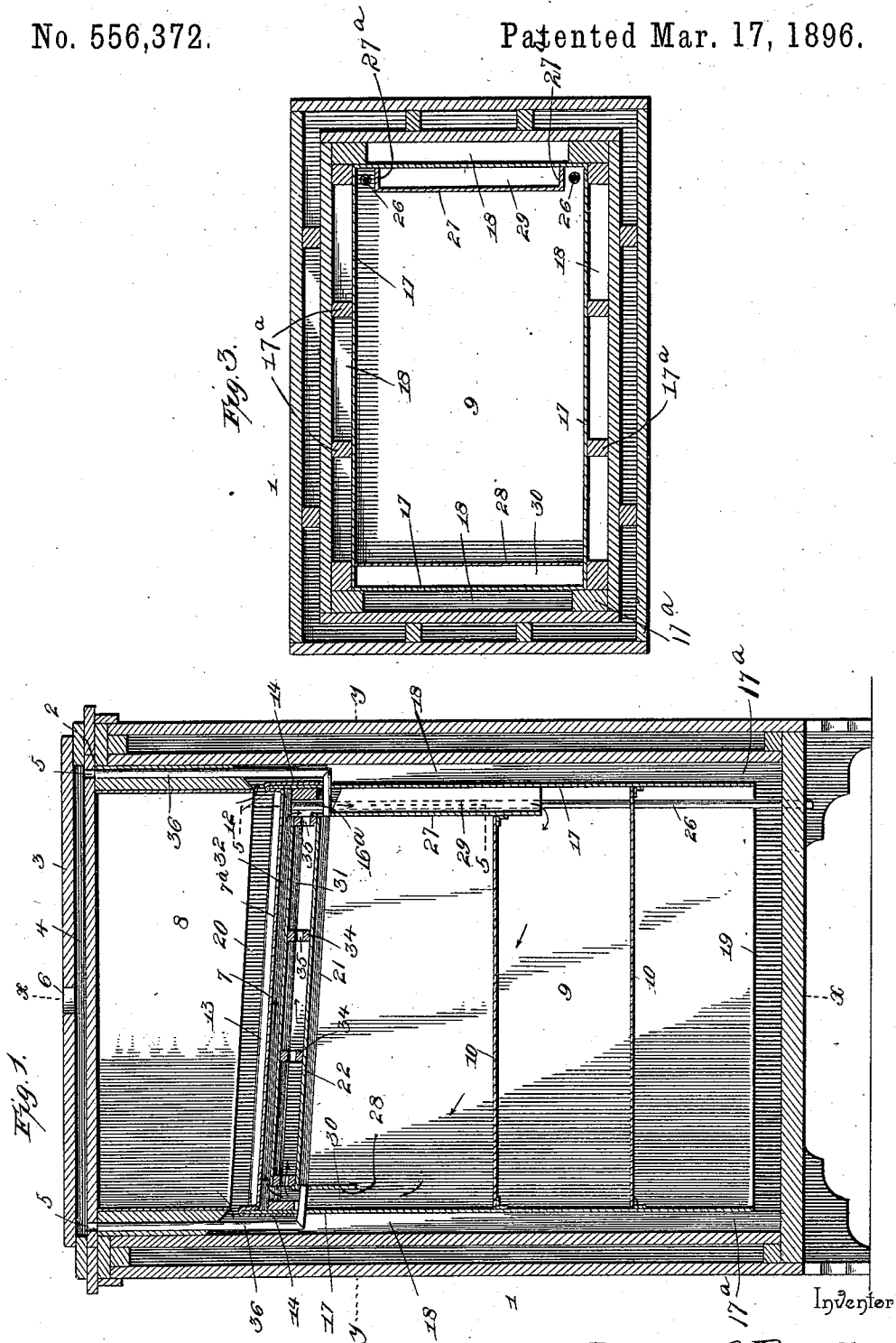


2 Sheets—Sheet 1.

Patented Mar. 17, 1896.

No. 556,372.



Witnesses

John C Shaw  
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By *his* Attorneys.

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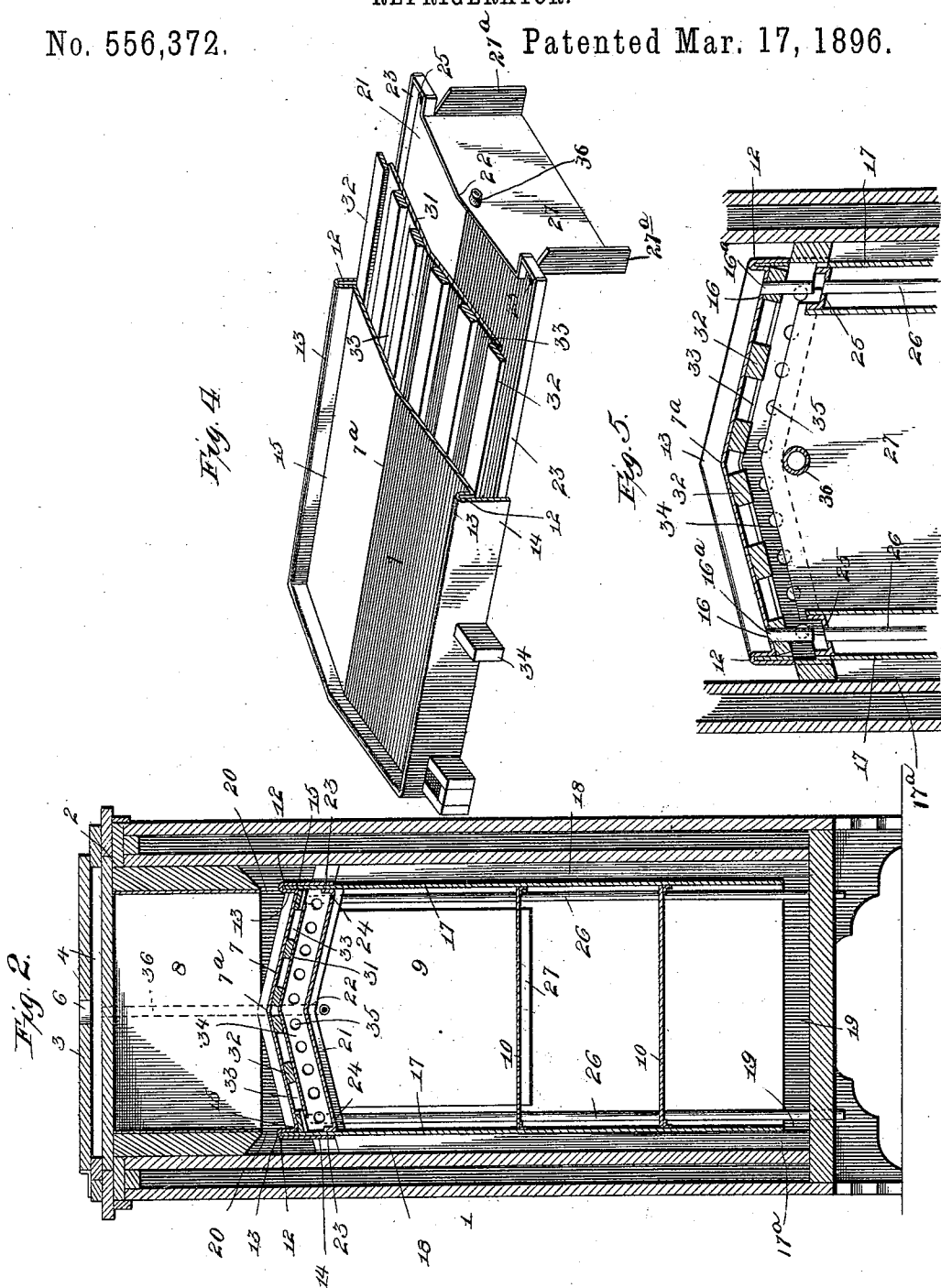
(No Model.)

2 Sheets—Sheet 2.

L. O. READ.  
REFRIGERATOR.

No. 556,372.

Patented Mar. 17, 1896.



Inventor

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# UNITED STATES PATENT OFFICE.

LAWSON O. READ, OF CHATTANOOGA, TENNESSEE.

## REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 556,372, dated March 17, 1896.

Application filed August 23, 1895. Serial No. 560,281. (No model.)

*To all whom it may concern:*

Be it known that I, LAWSON O. READ, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented a new and useful Refrigerator, of which the following is a specification.

This invention relates to refrigerators.

The main and primary object of the invention is to provide a new and useful construction of refrigerator providing for the perfect and complete circulation of cold air from the ice-chamber into the provision-chamber, and also for the free escape of warm air, whereby all odors are carried out of the refrigerator and the contents thereof kept perfectly cool and odorless.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a central vertical longitudinal sectional view of a refrigerator constructed in accordance with this invention. Fig. 2 is a transverse sectional view on the line *xx* of Fig. 1. Fig. 3 is a horizontal sectional view on the line *yy* of Fig. 1. Fig. 4 is a sectional perspective view of the drip-pan and the intermediate partition-plate arranged directly thereabove under the ice-floor plate. Fig. 5 is a detail sectional view on the line 5 5 of Fig. 1.

Referring to the accompanying drawings, the numeral 1 designates a substantially rectangular refrigerator box or casing, the side and end walls of which are constructed in the ordinary manner. The box or casing 1 is open at the top and is provided with a shouldered cover-seat 2, which receives therein the hollow cover 3. The hollow cover 3 incloses an interior air-circulating space, 4, and is provided in its under side, near its opposite ends, with the air-circulating openings 5, which carry warm air into the space 4, and in its outer side the hollow cover 3 is provided with a top escape-opening, 6, which forms a vent or escape for the air which is circulated into the space 4, and at this point it is to be noted that when the cover 3 is closed the cir-

culating-openings 5 are disposed at the upper edges of the end walls of the box or casing.

Arranged within the upper part of the box or casing 1 is the longitudinally-inclined metallic ice-floor plate 7, which separates the interior of the box or casing into an upper ice-chamber, 8, and a lower provision or storage chamber, 9, within which latter chamber may be arranged suitable racks or shelves 10 for supporting the provisions within the refrigerator. The plate 7 forms the floor of the ice-chamber 8 and is of a substantially inverted-V shape, being provided with a central longitudinal ridge 7<sup>a</sup>, which forms an apex at the center under side of the plate, and oppositely-inclined sides slanting toward opposite sides of the casing.

The inverted-V-shaped plate 7 is provided at the side and end edges thereof with vertically-disposed edge-seams 12, which are formed by doubling the metal upon itself at the edges of the plate to form upwardly-disposed flanges 13, projected above the plane of the plate, and the depending flanges 14, projected below the plane of the plate. The upwardly-disposed side and end flanges 13 of the ice-floor plate 7 form a pan to collect the water from the ice, and the flanges 13 at the opposite longitudinal side edges of the plate form longitudinal drain-gutters 15, which provide for a natural drain of the water toward one end of the refrigerator box or casing, and at the lower ends of the opposite drain-gutters 15 of the plate 7 the latter is provided with the drain-openings 16, in which are fitted the upper ends of the short downwardly-extending drain-pipes 16<sup>a</sup>.

The ice-floor plate 7 is smaller than the interior of the box or casing, so as to leave an intervening space between the side and end edges of the said plate and the inner sides and ends of the refrigerator box or casing, and the vertically-disposed edge-seams 12 at the side and end edges of the said plate 7 are adapted to receive therein the upper edges of the inner metallic flue-plates 17. The inner vertical flue-plates 17 are held spaced from the inner sides and ends of the box or casing by means of the spacing-timbers 17<sup>a</sup> to form the vertical side and end cold-air flues 18 at

the opposite sides and ends of the refrigerator box or casing, and the said plates 17 extend downward from the side and end edges of the plate 7 to a point short of the bottom of the box or casing to leave bottom cold-air passages 19 at opposite lower sides and ends of the box or casing. The cold air which circulates downward through the side and end cold-air flues 18 passes into the provision or storage chamber 9 through the bottom cold-air passages 19, and the upper ends of the said flues 18 communicate with the interior of the ice-chamber 8 through the inlet-passages 20, formed in the side and end walls of the ice-chamber 8, directly above the upper edges of the flanges 13 of the plate 7.

Suitably supported within the refrigerator box or casing, below and parallel with the ice-floor plate 7, is a longitudinally-inclined drip-pan 21. The longitudinally-inclined drip-pan 21 is also of a substantially inverted-V shape, and is provided with a central longitudinal ridge 22, corresponding to the ridge 7<sup>a</sup> of the plate 7, and which forms an apex at the central under side of the plate 21, and also forms oppositely-inclined sides slanting toward the opposite sides of the casing. At its opposite side edges the inverted-V-shaped drip-pan 21 is provided with the upturned flanges 23, forming longitudinal drain-gutters 24 at the opposite longitudinal side edges of the drip-pan, and by reason of the longitudinal inclination of the pan 21 the water which drips into the same will have a natural drain toward one end of the refrigerator box or casing, or, in other words, toward the lower end of the drip-pan. The said drip-pan 21 is provided therein at the lower end of the side drain-gutters 24 with the drain-openings 25, in which are fitted the upper ends of waste-water pipes 26, which extend downward through the bottom of the box or casing and discharge into a suitable waste-water receptacle. The said waste-water pipes 26 also serve to carry off the waste or drain water directly from the ice-floor plate 7, inasmuch as the short downwardly-extending drain-pipes 16<sup>a</sup> of the ice-floor plate are disposed directly over the lower ends of the drain-gutters 24 of the drip-pan 21.

The inverted-V-shaped drip-pan 21 is shorter in length than the distance between the vertical flue-plates 17 at the opposite ends of the refrigerator box or casing, and at its opposite ends the said drip-pan 21 has rigidly projected downwardly therefrom the long and short supplemental flue-plates 27 and 28, respectively, which flue-plates are spaced from the flue-plates 17 within the ends of the box or casing to form long and short supplemental circulating-flues 29 and 30, respectively.

In connection with the depending flue-plates 27 and 28 it will be noted that the flue-plate 28 extends entirely across the space between the flue-plates 17 within the sides of the box or casing and is joined at its ends to such side flue-plates 17, while the depending flue-plate 27 is shorter than the distance be-

tween the side flue-plates 17 and is provided at its ends with the outturned right-angulardisposed spacing-flanges 27<sup>a</sup>, which rest against the end flue-plates 17 adjacent to the flue-plate 27, and thereby provide a construction for completely closing in the circulating-flue 29.

The long and short supplemental circulating-flues 29 and 30 provide communication between the provision or storage chamber 9 and the space between the ice-floor plate 7 and the drip-pan 21, and at this point it is to be noted that the short supplemental flue 30, which is arranged at the high end of the pan 21, is about one-fourth the length of the opposite flue 29, in order that there may be a direct circulation across the chamber 9 from the flue 29 to the flue 30, as indicated by arrows in Fig. 1 of the drawings, and which circulation will be more particularly referred to.

Supported centrally between the ice-floor plate 7 and the drip-pan 21 is an intermediate partition-plate 31. The partition-plate 31 is disposed parallel to both the plate 7 and the pan 21, and is therefore also of the same cross-sectional shape as the said plate and pan; but the plate 31, which extends from end to end of the pan 21, is narrower than the latter, so that the sweat or drippings which fall from the under side of the plate 7 will run from the side edges of the plate 31 into the gutters 24 at the opposite longitudinal side edges of the drip-pan 21.

A series of parallel spacing-bars 32 are arranged longitudinally between the plates 7 and 31 to maintain the same relatively positioned, and also to form air-channels 33, through which the air circulates from the flue 30 to the flue 29 in the direction indicated by the arrows in the drawings, and in the space between the plate 31 and the pan 21 is arranged a series of parallel transverse spacing-bars 34, which are provided therein with a longitudinal series of circulating-openings 35, which allow the air to readily circulate through the air-circulating space confined between the plate 31 and the pan 21. At this point it will be observed that the upper and lower air-circulating spaces located respectively above and below the intermediate plate 31 are open at both ends, so as to communicate with the flues 29 and 30, as clearly illustrated in the drawings.

At both ends of the apex of the pan 21 the latter has connected therewith the lower ends of the opposite warm-air-escape pipes 36, which communicate with the interior of the provision or storage chamber 9. The warm-air-escape pipes 36 are fitted within the opposite ends of the refrigerator box or casing, and when the hollow cover 3 is closed the upper ends of the pipes 36 are adapted to align and communicate with the opposite air-circulating openings 5, formed in the under side of the cover near its opposite ends. When the refrigerator is in use, it will be understood that the cold air from the ice-chamber 8 descends

through the four side and end cold-air flues 18 into the bottom of the box or casing and displaces the warm air, the lighter portions of which warm air collect into the apex of the drip-pan 21, which forms the roof of the chamber 9, and escape out through the pipes 36 at the ends of said apex, and finally through the hollow cover 3. While the main portion of the warm air is thrown into the center of the chamber 9 and collects in the space at the under side of the pan 21, it will be noted that a cross-circulation of air is maintained from the lower end of the flue 29 to the lower end of the shorter flue 30, and the air that is not light enough to rise into the space at the under side of the pan 21 is caught by this cross-circulation and carried up through the short supplemental flue 30 into the air-circulating spaces above and below the plate 31. In these air-circulating spaces above and below the plate 31 the air is again chilled or cooled and is discharged through the flue 29 back into the provision or storage chamber 9, thereby completing a very efficient air-circulation for the refrigerator and providing means for thoroughly cooling and utilizing the air before it discharges through the pipes 36 and into the outer air.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a refrigerator, the box or casing having inner vertical cold-air flues at the sides and ends thereof, a longitudinally-inclined ice-floor plate arranged in the upper part of the box or casing and provided at its lower end with short depending drain-pipes, a drip-pan arranged below and parallel with the ice-floor plate, waste-water pipes leading through the bottom of the box or casing and connected at their upper ends with the drip-pan below said short drain-pipes, and an intermediate partition-plate arranged between the ice-floor plate and the drip-pan, and of a narrower width than the drip-pan, substantially as set forth.

2. In a refrigerator, the box or casing having inner vertical cold-air flues, an ice-floor plate arranged within the upper part of the box or casing, a drip-pan arranged below and parallel with the ice-floor plate to form an intermediate air-circulating space, and vertical flue-plates extended downward from the ends of the drip-pan to form supplemental circulating-flues communicating with the spaces

above and below the drip-pan, substantially as set forth.

3. In a refrigerator, the box or casing having inner vertical cold-air flues located at the sides and ends thereof, an ice-floor plate arranged within the upper part of the box or casing, a drip-pan arranged below and parallel with the ice-floor plate to form an intermediate air-circulating space, and long and short vertical flue-plates extended downward respectively from opposite ends of the drip-pan to form long and short supplemental circulating-flues communicating with the spaces above and below the drip-pan and providing a cross-circulation below the drip-pan from the lower end of the long flue to the lower end of the short flue, substantially as set forth.

4. In a refrigerator, the box or casing having inner vertical cold-air flues at the sides and ends thereof, an ice-floor plate arranged within the upper part of the box or casing, an inverted-V-shaped drip-pan arranged below and parallel with the ice-floor plate and of a shorter length than the latter, long and short vertical flue-plates extended downward respectively from opposite ends of the short drip-pan to form long and short supplemental circulating-flues, waste-water pipes connected with the drip-pan, and warm-air-escape pipes arranged at opposite ends of the box or casing and communicating with the interior of the box or casing at the ends of the apex of the drip-pan, substantially as set forth.

5. In a refrigerator, the box or casing having inner vertical cold-air flues at the sides and ends thereof, a longitudinally-inclined ice-floor plate arranged within the upper part of the box or casing, a drip-pan arranged below and parallel with the ice-floor plate and of a shorter length than the same, long and short vertical flue-plates extended downward respectively from opposite ends of the short drip-pan to form long and short supplemental circulating-flues, an intermediate partition-plate arranged centrally between the ice-floor plate and the drip-pan, said partition-plate being narrower than the drip-pan, a series of parallel spacing-bars arranged longitudinally between the ice-floor plate and the partition-plate, and a series of transverse spacing-bars arranged between the partition-plate and the drip-pan and provided with a series of circulating-openings, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

LAWSON O. READ,

Witnesses:

G. R. PHILLIPS,  
S. A. STRAUSS.