

Sept. 26, 1933.

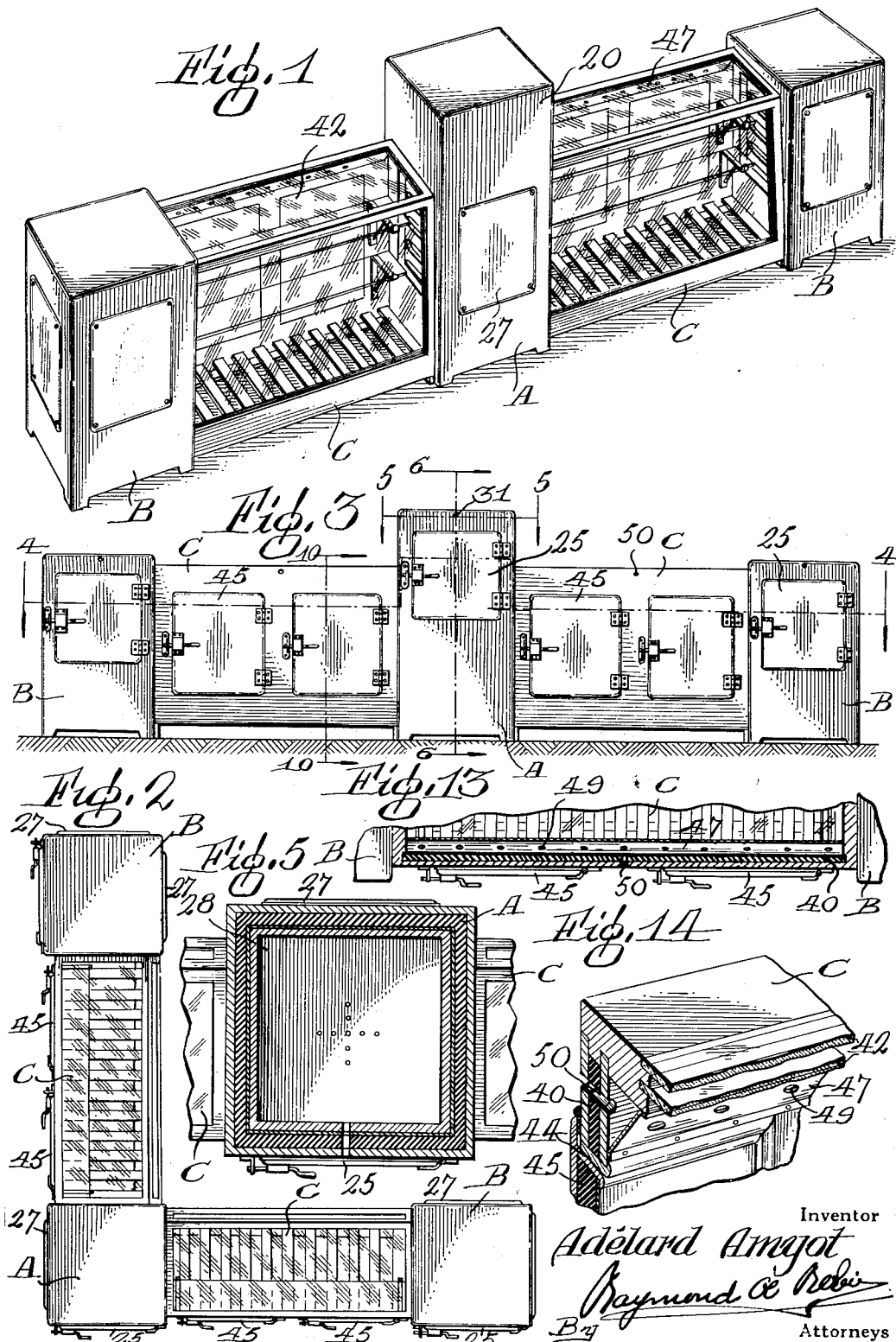
A. AMYOT

1,928,239

REFRIGERATOR

Filed March 15, 1933

3 Sheets-Sheet 1



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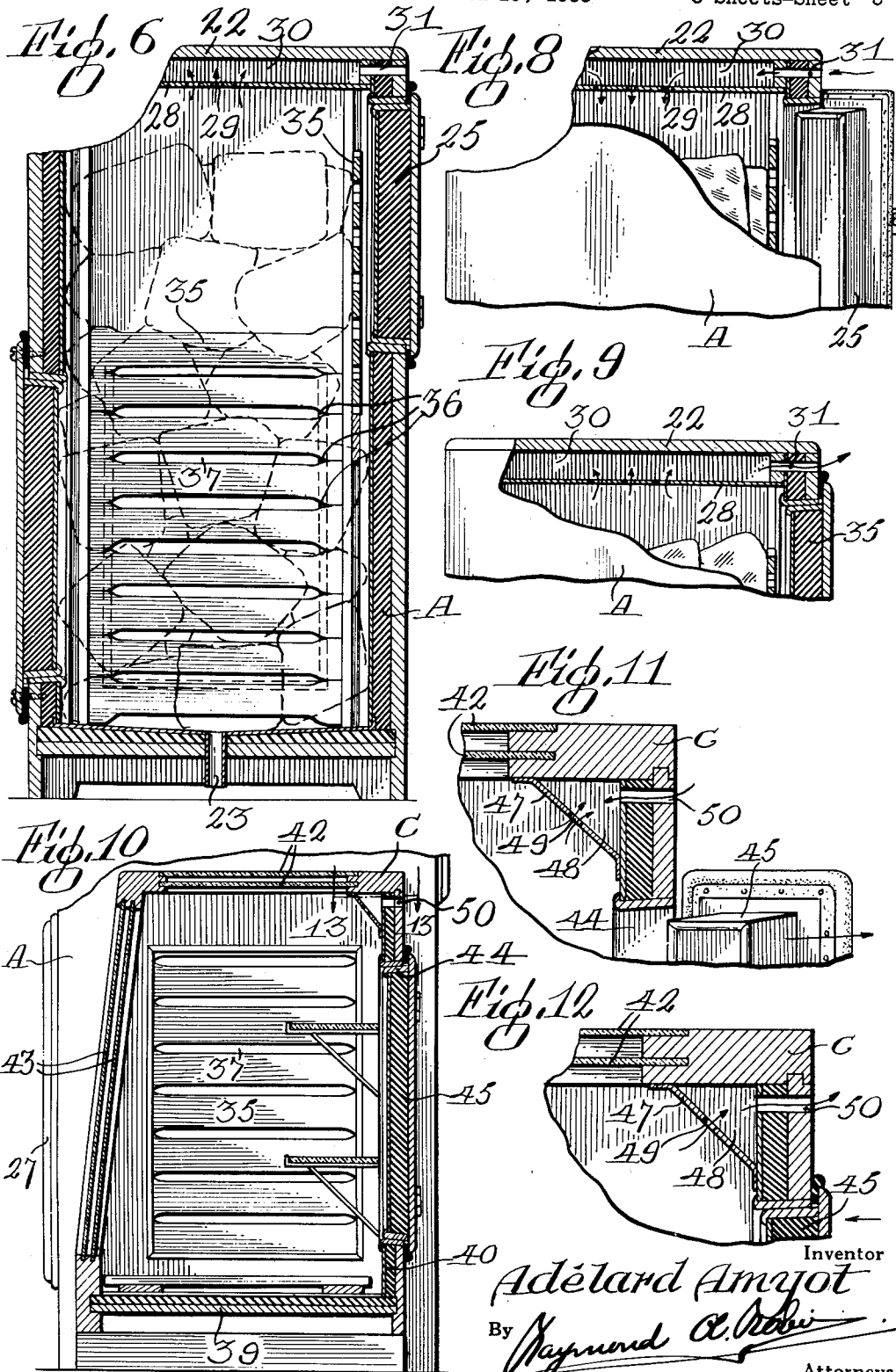
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UNITED STATES PATENT OFFICE

1,928,239

REFRIGERATOR

Adelard Amyot, Montreal, Quebec, Canada

Application March 15, 1933. Serial No. 660,836

2 Claims. (Cl. 62—37.2)

The present invention relates to improvements in refrigerator construction.

An important object of the invention is the provision of a refrigerator embodying an improved ventilating system designed so as to reduce to a minimum the loss of cooling air occasioned by the opening of the refrigerator doors.

Another important object of the invention is the provision of a novel refrigerator embodying in one compact assembly three units ordinarily separated: an ice box, or refrigerator proper, cooled show-cases, and counters comprised with the show-cases.

A further object of the invention is the provision of a refrigerator equipped with air reservoirs communicating with the interior chamber of the refrigerator and with the exterior thereof.

Another object of the invention is the provision of a refrigerator which may embody one or more ice containers and provision cases separably connected and capable of assembly in various forms.

Still another object of the invention is the provision of a refrigerator of the above character constructed so that the provision chambers thereof may be employed as display cases and are also adaptable for use as serving counters.

A still further object of the invention is the provision of a refrigerator of the above character which will be efficient in use and which may be readily disassembled for convenient transportation.

Other objects and advantages of the invention will become apparent as the description progresses.

In the accompanying drawings forming a part of this specification and in which like reference characters are employed to designate corresponding parts throughout the same:

Figure 1 is a perspective view showing one form of assembly of the refrigerator,

Figure 2 is a top plan view showing another form of assembly,

Figure 3 is a rear elevation of the refrigerator in accordance with the assembly shown at Figure 1.

Figure 4 is a longitudinal horizontal section taken on the line 4—4 of Figure 3,

Figure 5 is a similar view taken on the line 5—5 of Figure 3,

Figure 6 is a vertical section taken on the line 6—6 of Figure 3,

Figure 7 is a vertical longitudinal section through the assembled refrigerator,

Figure 8 is a fragmentary vertical section taken through the upper portion of one of the ice con-

tainers, showing the door in partially open position,

Figure 9 is a similar view with the door in closed position,

Figure 10 is a vertical transverse section taken on the line 10—10 of Figure 3,

Figure 11 is a fragmentary vertical section through the upper portion of Figure 10 showing the door in open position,

Figure 12 is a similar view with the door in closed position,

Figure 13 is a longitudinal section taken on the line 13—13 of Figure 10, and

Figure 14 is a fragmentary perspective view through the upper rear structure of one of the provision cases.

Referring to the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the letter A generally designates one of the ice containers embodying a vertically elongated casing 20 of rectangular cross section. The container casing is preferably to be of insulating construction and includes, in addition to the front, rear and side walls, a bottom 21 arranged to assume a position above the floor line and a top plate 22. The top surface of the bottom or floor structure 21 is designed to provide an inclination toward the centre, so that the drippings from the ice will flow through a centrally disposed depending discharge pipe 23.

The rear wall of the container casing 20 is provided with an elevated filling opening normally closed by a hinged door 25. The front and side walls are formed with relatively large rectangular shaped openings 26 arranged lower than the filling opening in the rear and, when not in use, are closed by means of removable covers 27.

In the upper portion of the ice chamber is secured a horizontal partition plate 28 provided with a plurality of apertures 29. The partition 28 is disposed at a predetermined position below the top plate 22 to provide an upper compartment 30 in the container. A ventilating duct 31 is formed through the upper portion of the container front wall, this duct affording communication between the compartment 30 and the exterior of the container.

Secured in the vertical corners of the container wall structure and extending from the bottom of the container to the partition 28 are four bars 33 provided in two exterior faces thereof with longitudinal, vertically extending channels 34. Slidably and removably fitted in the channels 34 are a plurality of flat elongated bars 35 having the opposed longitudinal edges indented, as indi-

cated at 36, intermediate the ends. As shown to advantage at Figures 6 and 7, the bars 35 are disposed in horizontally extending superposed positions in oppositely arranged channels of the container and, in assembly, form therebetween narrow elongated interstices 37. Thus, the bars may be arranged to form interior barrier walls inwardly of the filling opening of the container as well as the openings in the front and side walls.

The container A constitutes a master ice-box which is to be usually supplemented by one or more, in the present instance two, auxiliary ice containers B. The containers B are constructed in correspondence with the master box A with the exception that the auxiliary boxes are of reduced height with respect to the master container, the purpose of which will become apparent as the description progresses.

The refrigerator assembly also embodies a plurality of provision chambers connected to and communicating with the interior of the ice containers. These provision chambers are in the form of elongated cases C, preferably embodying a wood or metallic frame structure substantially rectangular in cross section. The cases C embody solid bottom flooring 39, a rear wall 40 and marginal end frames 41. The rear wall 40 and, if desirable the flooring 39 and the end frame structures 41, may be of insulating construction. The casing frames are formed so that the top comprises a pair of parallel spaced glass panes 42 and the front a pair of similar panes 43 providing transparent wall structures having dead-air spaces between the panes. The rear wall 40 of each case C is provided with a pair of relatively large door openings 44 normally closed through the medium of hinged mounted doors 45 constructed to afford a substantially air tight connection when closed. The end frames 41 define relatively large rectangular shaped openings 46, approximately corresponding in shape and size to the openings 26 in the front and side walls of the ice containers.

Rigidly mounted on each case C, at the junction of the rear wall and the top transparent wall structure, is an elongated partition plate 47 extending substantially the full length of the case and arranged transversely at an oblique angle so as to form in the upper rear portion an elongated corner compartment 48 approximately triangular in cross section. At longitudinally spaced intervals, the partition plate 47 is provided with ventilating apertures 49. A ventilating duct 50 is formed through the upper portion of the rear wall 40 of each case, providing a passage whereby the compartment 48 communicates with the exterior.

To assemble a plurality of container and provision case units to form a counter and display box of the form shown at Figure 1, the covers 27 are removed from the side openings of the master container A and the corresponding covers removed to uncover one side opening of each of the auxiliary containers B. A pair of cases C are arranged at each side of the master container and against the side of each of the auxiliary boxes, so as to provide an alternate arrangement of boxes and provision cases. In connecting the boxes and cases, the ends of the cases may be initially supported on transversely extending bars 52 secured to and extending transversely along the lower margin of the boxes and are thereafter bolted to the adjacent side walls of the boxes by means of bolts 53 extended through the adjacent walls about the margin of the reg-

istering openings 26 and 46. When connecting the cases with the boxes, a filler strip 54 of rubber or other suitable packing material is to be disposed between the marginal edges of the contacting faces, as shown to advantage at Figure 7, to obtain an approximately air-tight connection between the units. As illustrated at Figure 7, the cases C will assume positions elevated above the flooring of the store in which the refrigerator is assembled.

When thus connected, the assembled structure provides an alternate arrangement of ice and provision chambers presenting a structure which may be effectively employed as a counter and as a display case for displaying provisions and various commodities disposed in the provision chambers of the refrigerator. Each of the containers A and B is to be substantially filled with ice or other form of cooling medium. The auxiliary containers B are approximately equal in height to the cases C. The centrally disposed master container A is, however, of substantially increased height with respect to the position of the cases and the construction of the auxiliary containers so that ice may be packed into the container A to a level substantially above that of the cases. This construction is designed to assure effective circulation of cool air through the upper parts of the cases, the stream of air flowing, as indicated by the arrows in Figure 7, from the master container along the upper sections of the cases while the end auxiliary containers B supply air currents flowing through the lower and intermediate portions of the provision chambers.

It will also be noted that during use of the refrigerator a supply of cool air will be maintained in the compartments 30 of the ice containers as well as the compartments 48 of the cases, the air being supplied thereto through the vents 31 and 50 respectively from the exterior of the refrigerator. When the filling door 25 of an ice container unit is opened for charging the container with ice, the escape of cold air from the ice chamber will be largely compensated for by the inrush of cooled air from the compartment 30 therein, the cool air of the compartment being replaced by the warm air from the exterior. When the filling operation is completed and the door closed, the pressure effected by the closure of the door will cause a discharge of the warm air accumulated in the compartment 30 and will replace, or partially replace, the same with the cold air from the ice chamber. Similar action is caused upon the opening of one of the doors of the provision cases, the compartment 48 serving as a reservoir for cooled air which is drawn into the provision chamber when the door is opened. Upon closure of the door the warm air, which has temporarily replaced the cool air in the reservoir, is forced outwardly through the duct 50 and replaced or partially replaced by cold air from the provision chamber.

This construction will greatly reduce the consumption of cooling medium and obviate a substantial decrease in the temperature of the ice and provision chambers by opening the doors thereof inasmuch as the entrance of warm air to these chambers is largely eliminated.

It will also be noted that the construction of the ice containers and provision units will enable assembly in various forms. In Figure 2 is shown an angular assembly embodying a master and two auxiliary ice-boxes and a pair of provision cases. It will become apparent that various modifications of assembly may be effected along this

line and that the number of units may be varied in accordance with the size of refrigerator required.

in side walls of the containers, means for detachably connecting the ends of the cases against a side wall of the respective containers, and doors attached to the said containers and cases.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same, and that various changes as to the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

2. In a refrigerator, the combination of a relatively high master ice container having openings in side walls thereof, a plurality of auxiliary ice containers of reduced height relative to the master container having openings in side walls thereof, a plurality of provision cases having openings at the ends disposed to register with the openings in side walls of the containers, means for detachably connecting the ends of the cases against a side wall of the respective containers, doors attached to the said containers and cases, and covers for enclosing unused side wall openings of the containers.

Having thus described my invention, I claim:—

1. In a refrigerator, the combination of a relatively high master ice container having openings in side walls thereof, a plurality of auxiliary ice containers of reduced height relative to the master container having openings in side walls thereof, a plurality of provision cases having openings at the ends disposed to register with the openings

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