M. F. EWEN.

REFRIGERATING CABINET.

APPLICATION FILED MAR. 25, 1916.

1,337,696.

Patented Apr. 20, 1920.

3 SHEETS—SHEET 1.

FIG. 1.

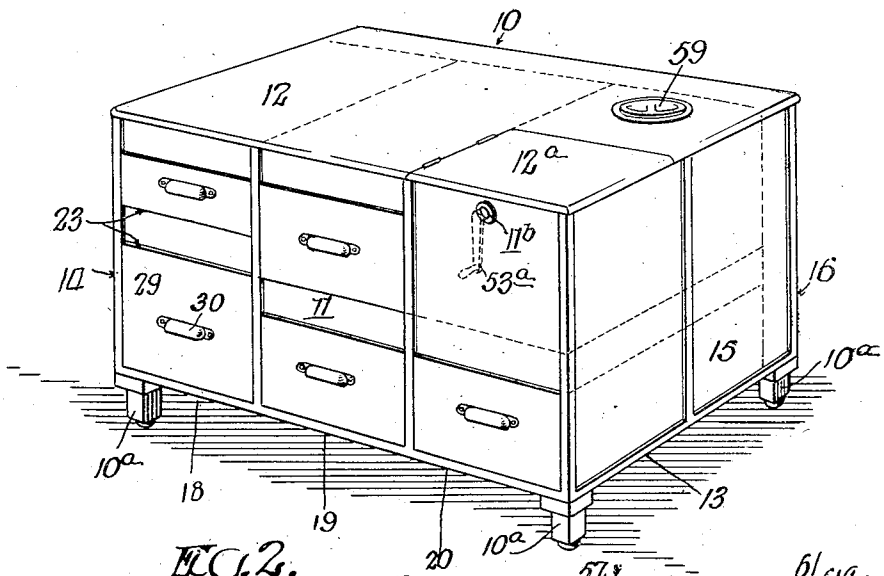
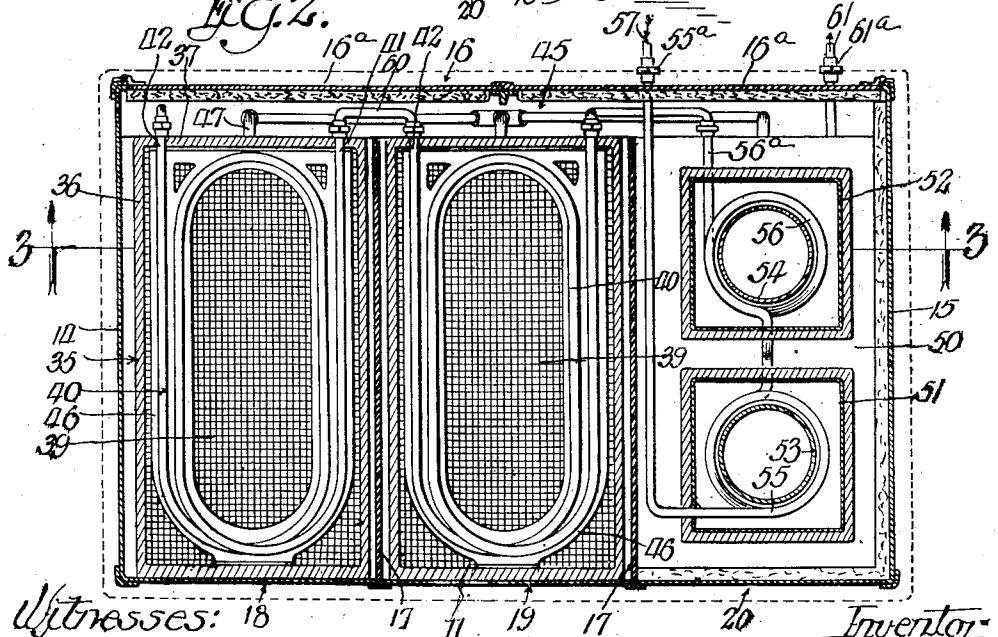


FIG. 2.



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3 SHEETS—SHEET 2.

FIG. 3.

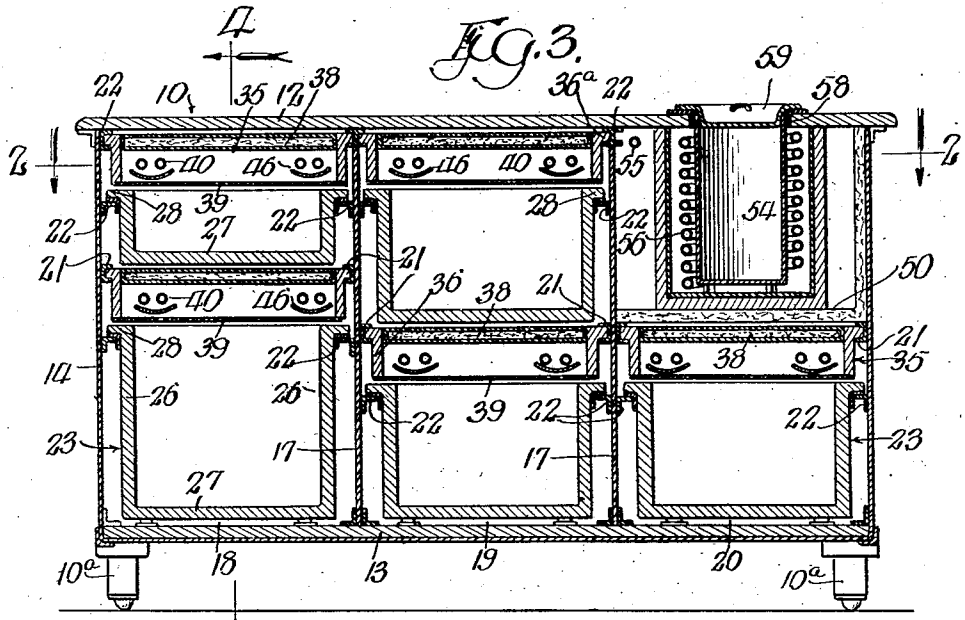
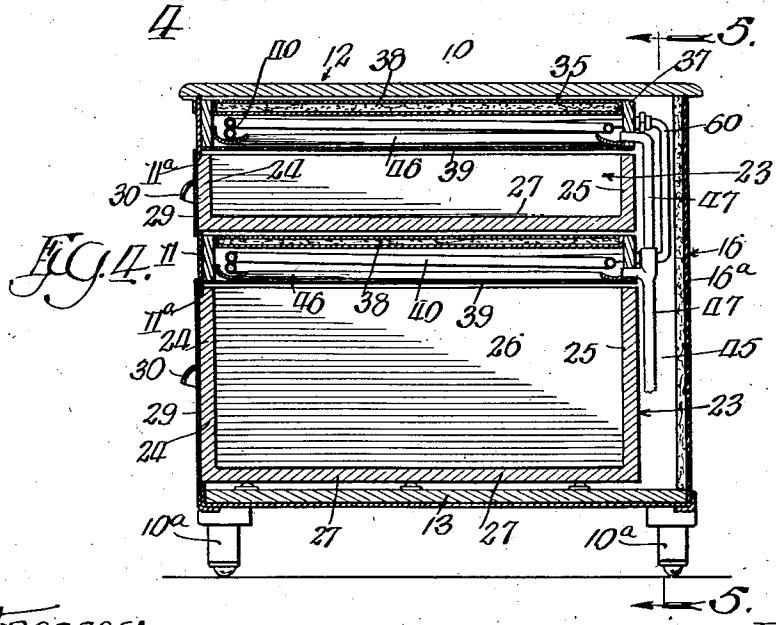


FIG. 4.



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3 SHEETS—SHEET 3.

FIG. 5.

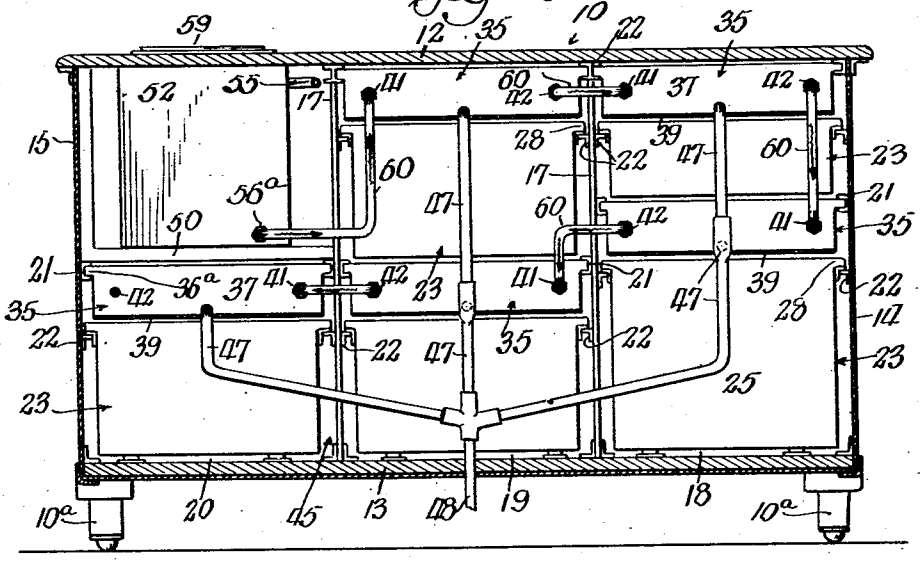


FIG. 6.

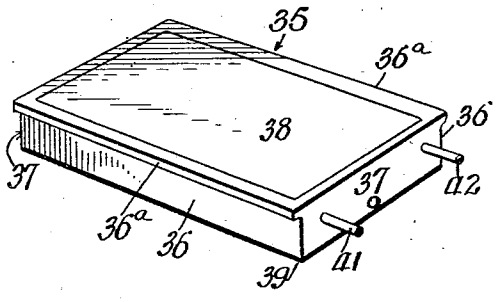
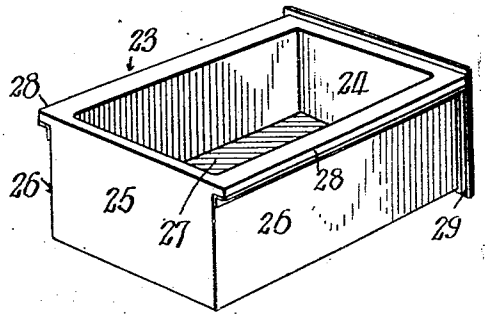


FIG. 7.



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UNITED STATES PATENT OFFICE.

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REFRIGERATING-CABINET.

1,337,696. Specification of Letters Patent. Patented Apr. 20, 1920.

Application filed March 25, 1916. Serial No. 86,587.

To all whom it may concern:

Be it known that I, MALCOLM F. EWEN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Refrigerating-Cabinets; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to a novel and improved refrigerating cabinet or table and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The object of the invention is to provide a refrigerating device, preferably in the form of a cabinet, table, or the like, containing a plurality of separate, independent insulated drawers, each of which has associated with it and located above it a refrigerating unit which is adapted to maintain it at the desired low temperature. In carrying out the invention the several refrigerating units and the associated drawers are arranged in a casing or attached to a suitable support in such manner that each drawer may be withdrawn from the casing or support from its normal position beneath its associated refrigerating unit, when it is desired to remove or to add to the provisions, food or other articles the drawer is adapted to contain. During the short period that the drawer is open, as the air contained within it is cold and heavier than the outer air, substantially all of the cold air will remain in the drawer just like any other fluid or liquid heavier than air and only such small part will be displaced by the warmer air as may occur by reason of the removal from the drawer of some of its contents. The slight interchange of temperature due to transfusion between the air in the drawer and the outer air is almost negligible, so that when closed the drawer and its contents will be practically as cold as it was when opened. In addition, each drawer and its refrigerating unit are closed off and segregated from each of the other drawers and units so that any raising of temperature when a drawer is opened will have effect only upon the contents of the drawer and will not, as in an ordinary refrigerator, affect the contents of the other drawers. In addition, as will appear, there is no head or colmun of cold air above the level of the drawers, so that tight joints between the drawers and the casing or support are not required to prevent leakage of cold air, as in the case of ordinary refrigerators.

The casing or support as shown herein, is made in the form of a box set upon legs and having a top wall, which provides a table, but, manifestly, the support may assume other forms, or types. The device illustrated may be used in a kitchen as a kitchen table and the food and other articles that may be required in the course of preparing a meal, may be withdrawn from the refrigerator as from any other cabinet and are at hand for use in preparation on the top of the table.

The many advantages of my invention will appear more clearly as I proceed with my description.

In the drawings:—

Figure 1 is a perspective view of my improved refrigerating table.

Fig. 2 is a horizontal sectional view through my improved table, the plane of the section being indicated by the line 2—2 of Fig. 3.

Fig. 3 is a longitudinal, vertical, sectional view, the plane of the section being indicated by the line 3—3 of Fig. 2.

Fig. 4 is a transverse, vertical, sectional view, the plane of which is indicated by the line 4—4 of Fig. 3.

Fig. 5 is a longitudinal vertical sectional view, the plane of which is indicated by the line 5—5 of Fig. 4.

Fig. 6 is a perspective view of one of the refrigerating units forming a part of my improved refrigerating table.

Fig. 7 is a perspective view of one of the containers or drawers forming a part of my refrigerating table.

Referring now in detail to that embodiment of my invention illustrated in the accompanying drawings:—10 indicates as a whole a refrigerating table or cabinet. It is made preferably in the form of a box-like, sheet-metal casing, mounted upon short upright legs 10^a, located at the several bot-

tom corners of the casing. It comprises, as shown, a front wall 11, top and bottom walls 12 and 13, end walls 14 and 15, and a rear wall 16. The latter wall is formed by doors 16ª, 16ª. Said doors are hinged to the rear upright edges of the end walls 14, 15, and when in closed position, as shown in Fig. 2, the free end of one door overlaps that of the other.

17, 17 indicate upright partitions which extend from the top wall 12 to the bottom wall 13 of the casing, and from the front wall 11 toward the rear wall 16, but which terminate a short distance from said rear wall. Said partitions divide the casing into three divisions or compartments, 18, 19 and 20, respectively.

In each compartment are provided one or more drawers or containers adapted to receive the various articles to be refrigerated. Said drawers or containers may be withdrawn from the casing, to give access to their contents through openings in the front and top walls 11 and 12 respectively. With each drawer or container is associated a refrigerating unit as follows.

To the inside surface of the end walls 14 and 15 and to both sides of the partition walls 17 are fixed a plurality of vertically spaced horizontal rails 21, 22, arranged in pairs and extending rearwardly from the front wall 11, the full, horizontal length of the partition walls 17. The rails 21 are channel bars and the rails 22 are angle irons. On each horizontal pair of rails 22 is mounted an open-top drawer 23 (see Fig. 7).

Each drawer 23 is made of suitable non-heat conducting material, and as all of said drawers are alike except in vertical depth, a detailed description of one will suffice for all. Each drawer has upright front and rear walls 24, 25, upright side walls 26, 26, and a bottom wall 27. Horizontal flanges 28, 28 are provided at or near the top edge of each side wall 26 to engage and bear upon the associated rails 22. To the front wall 24 is fixed a plate 29, the edges of which project beyond the edges of said front wall and close upon the front wall 11 of the casing about a drawer-opening 11ª therein. (See Fig. 4). Thus when the drawer is pushed as far as may be into the casing, the said plate 29 will seal the casing and also the drawer against the entrance of the outside air. A drawer pull or handle 30 is fixed to the plate 29.

Immediately and closely above each drawer 23 is placed an associated refrigerating unit 35 (see Fig. 6). Each refrigerating unit as shown is made in the form of a comparatively shallow, rectangular box, which is of substantially the same plan area as the drawer. Said box has upright side walls 36, 36, upright end walls 37, 37, a horizontal top wall 38, all made of suitable heat-insulating material. A wire netting 39 is preferably attached to the bottom edges of the side and end walls to prevent articles in the drawer from becoming entangled with the walls of the refrigerating unit so as to prevent the ready opening of the drawer below it. The side walls 36, 36 are provided at the top with horizontally extending flanges 36ª, which are adapted for engagement with the channel bars forming the rails 21. Within each refrigerating unit is provided a refrigerating coil 40 which is connected with a suitable refrigerating apparatus and may constitute an expansion coil or may contain brine, depending upon the apparatus used. 41 indicates the inlet end of said coil, and 42 its outlet end. Both extend through the rear end wall 37 of the box 35 and project into a compartment or space 45 left at the rear of the casing between the drawers and refrigerating units and the rear wall 16 of the casing.

Each refrigerating unit 35 is preferably provided with a trough 46 located beneath the expansion coil 40 therein to catch the water of condensation which falls when the coil is defrosting. This water of condensation will not collect under normal conditions when the refrigerating apparatus is working properly, but such catch troughs are desirable when the refrigerating apparatus is cut off as upon a contemplated absence during which the refrigerating device is not to be used. Each trough drains into a slip pipe 47 located in the compartment 45 of the casing, at the rear of the refrigerating units and the several pipes 47 are detachably connected to a common drain pipe 48 which extends downwardly through the bottom wall 13 of the casing where it may discharge into any suitable drain pipe leading, for example, to a sewer.

The division or compartment 20 of the casing (that is, the division at the right hand end of the table as looked at in Figs. 1 and 3 of the drawings), is provided intermediate its top and bottom with a horizontal wall 50, preferably made of an insulating material, below which is located one drawer 23 and an associated refrigerating unit 35. Above said wall are provided two freezing compartments 51, 52. One of these, preferably the one 51, is arranged to receive an ice cream freezing can 53 and the other is arranged to receive any suitable can mold 54 in which water may be frozen into any desired shape or form. The latter compartment may also be used as a storage place for the ice cream made in the can 53, while said can is being used again for making additional ice cream or other frozen desserts. Each compartment is made in the form of an open top rectangular casing of insulating material, the top edges of which are flush

with the bottom surface of the top wall 12 of the casing which forms the top of the table. The compartment 51 contains a circular coil 55, the inlet end of which extends through the space or compartment 45 and through the rear wall 16 of the casing, where it is connected by means of a coupling 55[a] with a pipe 57 leading from the supply line of the refrigerating apparatus (not shown). The outlet end of said coil 55 is connected to the inlet end of a like coil 56 in the compartment 52. The outlet end 56[a] of the coil 56 extends into the compartment 45 where it is connected with the coils of the refrigerating units 35, as will be presently described. Each compartment (51, 52) is so made as to be capable of containing brine if desired.

To give access to the compartment 51 so that the ice cream freezing can may be inspected during its use and to permit its withdrawal, a hinged lid 12[a], forming a part of the top wall 12, (see Fig. 1) is provided above the compartment 51. The front wall 11 of the casing has an aperture 11[b] through which a crank handle 53[a] may be connected with the agitator and can rotating mechanism of the ice cream freezer. In the top wall 12 and above the can 54 in the compartment 52 is provided an opening 58 of the diameter of the can. Said opening is closed by a removable cover 59 and gives access to the interior of the can.

All of the coils used in the table are as shown connected in series, the inlet end of one coil being connected to the outlet end of the next adjacent coil by suitable pipe connections and associated unions 60. The pipe 57 to which is connected the inlet end of the coil 55 in the compartment 51 leads from the supply line of the refrigerating apparatus and the outlet end of said coil 55 is connected to the inlet end of the coil 56 in the compartment 52 as above stated. The outlet end 56[a] of the coil 56 is connected to the inlet end 41 of the coil 40 in the top refrigerating unit 35 of the central compartment or division 19 of the casing. The outlet end 42 of the last named coil is connected to the inlet end 41 of the coil of the top refrigerating unit of compartment or division 18. The coil of said unit is connected to the coil of the unit next below in the same division, which is connected in the same way to the coil in the bottom unit of division 19. The coil of the latter unit is connected in like manner to the coil of the bottom unit of the division 20. The outlet end of the last named coil is extended through the compartment 45 at the back of the casing and through the rear wall 16 of the casing, where it is attached by a union 61[a] to the pipe 61, which is connected to the return line of the refrigerating apparatus.

It will be manifest from the foregoing description that the open top of each drawer 23, is arranged in close relation with the bottom of the associated refrigerating unit so that said drawer may in effect be said to be closed against said refrigerating unit. Thus each drawer and its refrigerating unit is segregated from and is independent of all other drawers and refrigerating units in the casing.

The arrangement described, prevents the temperature of any drawer from affecting that of the other drawers, which, as will be manifest, may be maintained at the same or at different temperatures. When a drawer is withdrawn, the cold air is retained therein by gravity, as water in a bucket, and even allowing the drawer to remain open, by reason of carelessness or otherwise, for a considerable period of time, will have no material effect upon the temperature of its contents. The predetermined temperature of each drawer is thus practically maintained at all times, and the disadvantages of the usual refrigerators due to the constant warming up and then recooling of the contents, are entirely obviated. As each refrigerating unit is located directly and closely above the drawer with which it is associated, there is substantially no head or column of air above the open-top of the drawer to dissipate the cold air, so that the necessity for tight joints to close off the drawer is done away with.

The many advantages of my improved refrigerating device, particularly for foods and other articles which must be maintained at a constant, unchanging cool temperature, as for example pasteurized milk, will be manifest to those familiar with the operation and construction of refrigerators.

It will be manifest from the construction and arrangement of the drawers, refrigerating units, pipe connections, etc., that all parts may be removed for purposes of cleaning, it being possible to get at the connections of the pipes in the compartment 45 by opening the rear doors 16[a].

While in describing my invention, I have referred to certain details of mechanical construction and arrangement, it is to be understood that the invention is to be in no way limited thereto, except as may be pointed out in the appended claims.

I claim as my invention:

1. In combination with the supply and return line of a refrigerating apparatus, a refrigerating cabinet comprising a casing having one or more compartments, each provided with a front opening, an open top drawer in each compartment, movable into and out of said compartment through said opening, said drawer having a front wall adapted to normally close said opening, and a refrigerating unit including a coil fixed in each compartment immediately above the space in said compartment occupied by said

drawer, said coil being connected to the supply and return line of the refrigerating apparatus.

2. In combination with the supply and return line of a refrigerating apparatus, a cabinet comprising a casing having a plurality of compartments, each provided with a front opening, a plurality of open top drawers, one for each compartment, movable horizontally into and out of the associated compartment through the opening thereof, each drawer having a front wall adapted to normally close said opening, and a plurality of refrigerating units, each including a coil, fixed in said compartments, one above the space in each compartment occupied by the associated drawer, all of the coils of all of said refrigerating units being connected to the supply and return line of the refrigerating apparatus.

3. A refrigerating cabinet comprising a casing having top, bottom and upright front, rear and end walls, means dividing said casing into a plurality of compartments, one of said upright walls having openings therein, there being one opening for each compartment, a drawer movable into and out of each compartment through the associated opening, each drawer having a front wall normally closing off the associated opening, an open bottom box in each compartment immediately above the space occupied by the associated drawer, a refrigerating coil in each open bottom box, and means connecting all of said coils in said boxes together in series.

4. A refrigerating cabinet or table comprising a casing having a front wall in which are provided drawer openings, means in said casing dividing the same into a plurality of transverse compartments and a longitudinal compartment at the back of the casing, said drawer openings providing entrances into said compartments, a drawer movable into and out of each transverse compartment through an associated drawer opening, each drawer having a front wall normally closing the associated opening, an open bottom box in each transverse compartment immediately above the space occupied by the drawers, a refrigerating coil in each open bottom box and having inlet and outlet ends extending into said longitudinal compartment, and means in said longitudinal compartment connecting the extending ends of said refrigerating coils together in series.

In testimony that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 9th day of March A. D. 1916.

MALCOLM F. EWEN.

Witnesses:
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