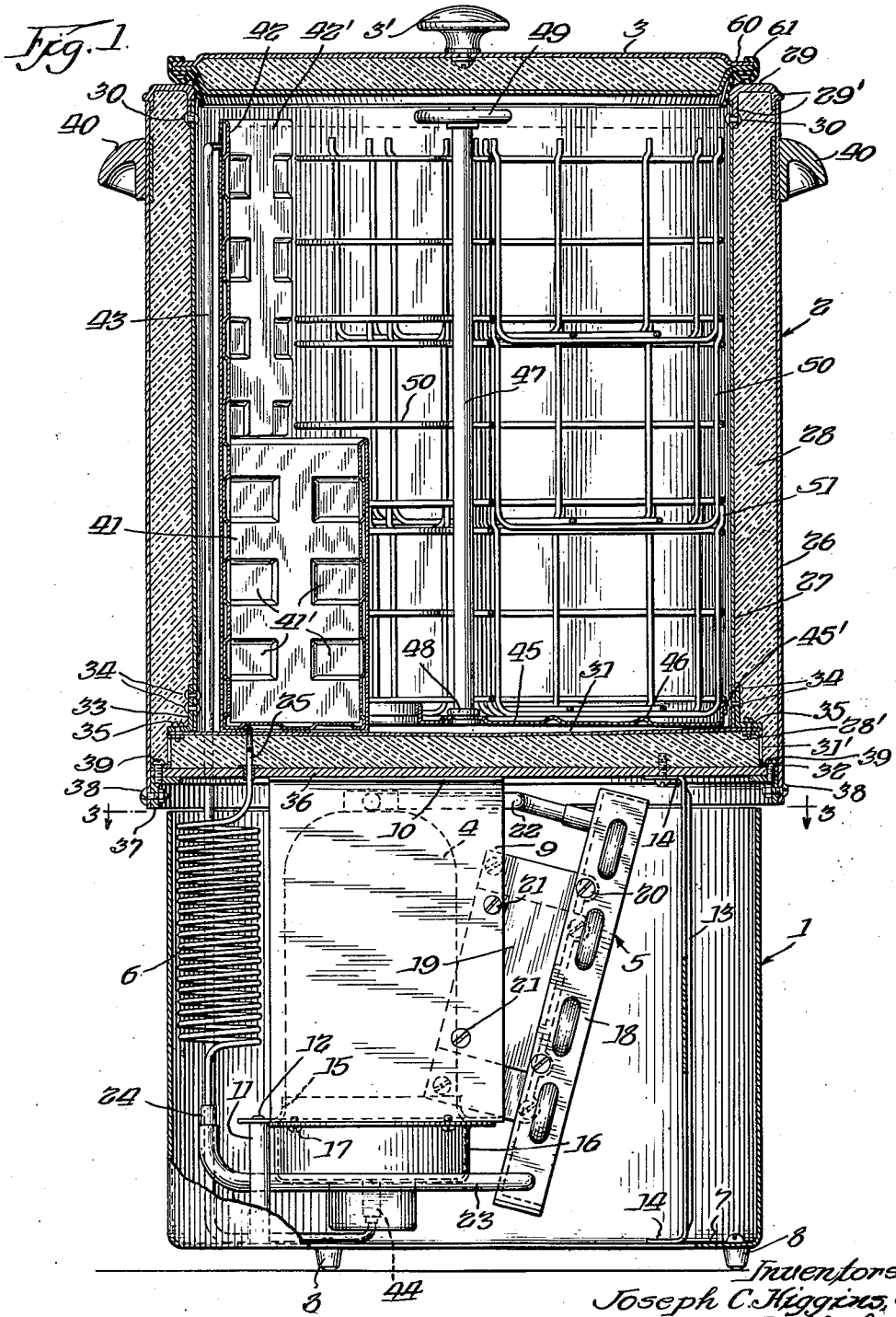
Jan. 2, 1951 J. C. HIGGINS ET AL 2,536,287

PORTABLE REFRIGERATOR

Filed March 3, 1948 4 Sheets-Sheet 1

Fig. 1.



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PORTABLE REFRIGERATOR

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Fig. 2.

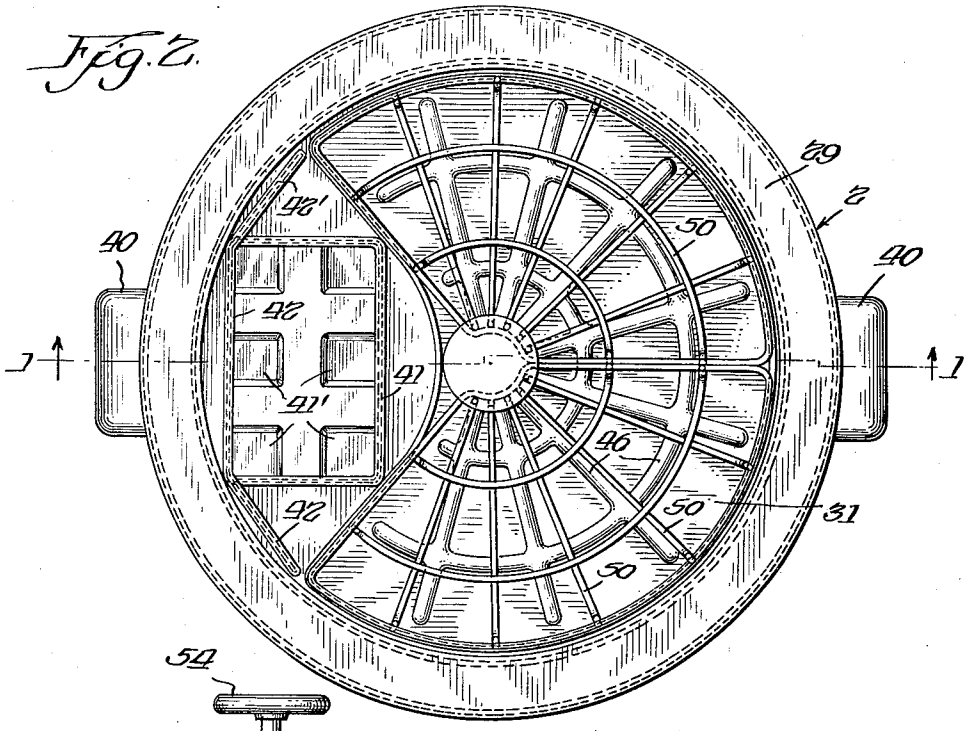


Fig. 5.

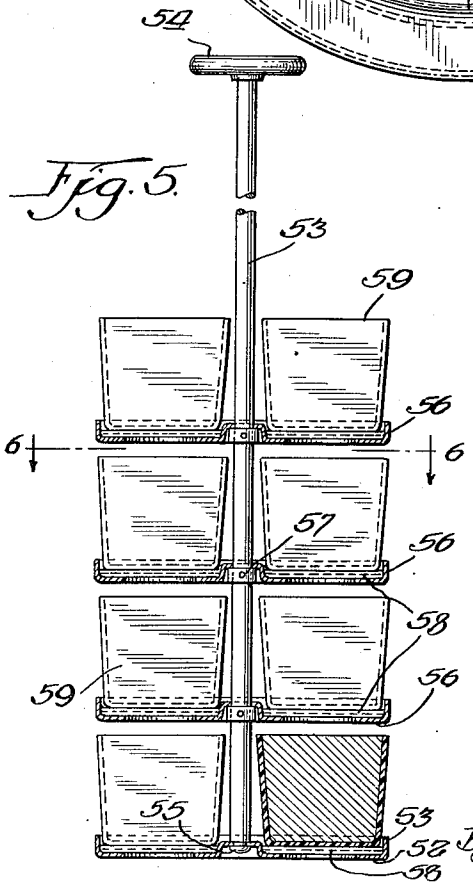
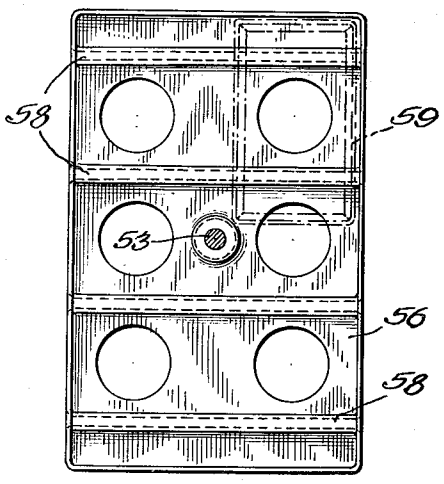


Fig. 6



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PORTABLE REFRIGERATOR

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Fig. 3.

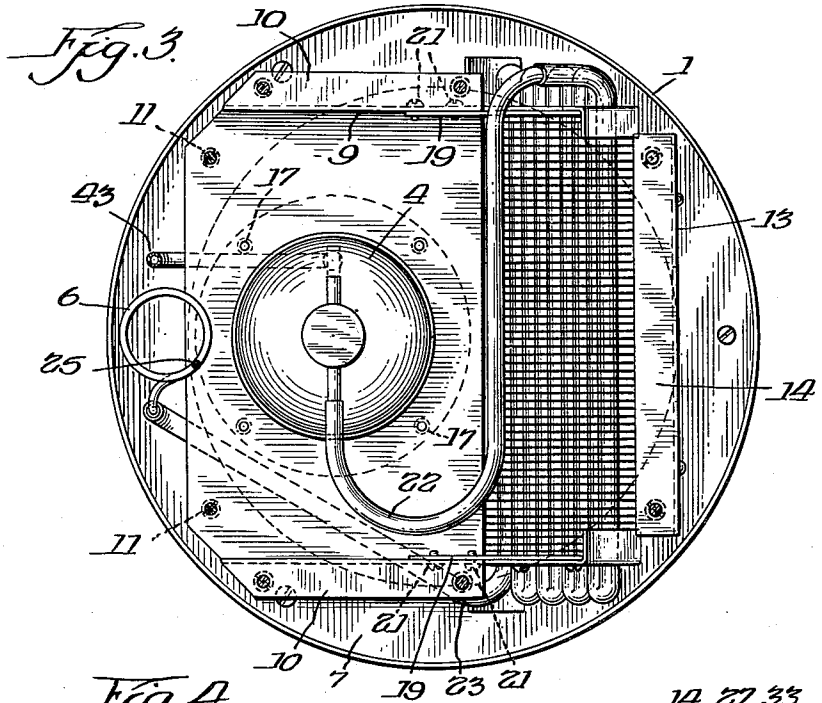
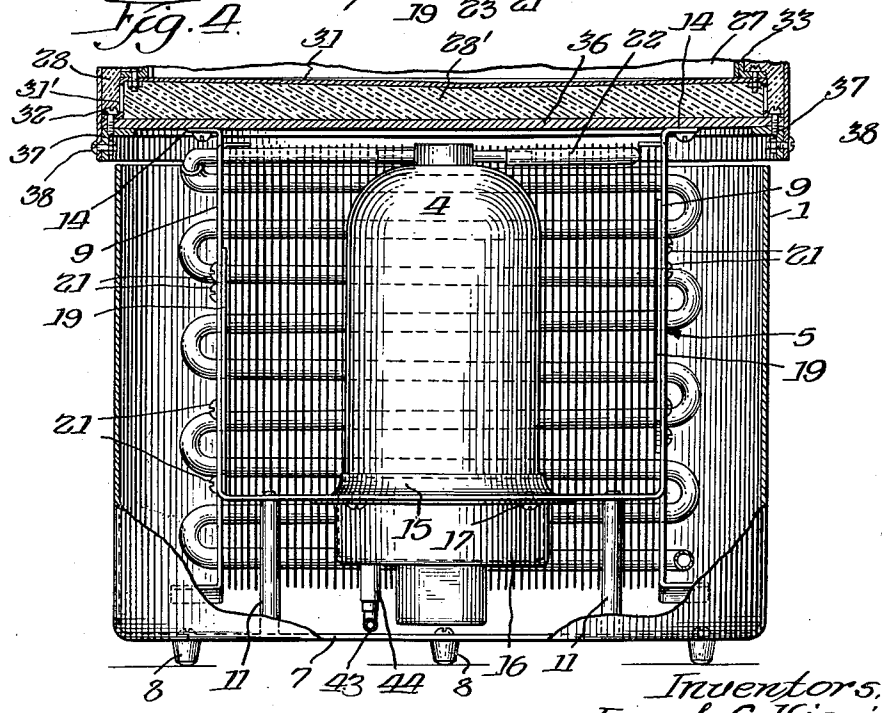


Fig. 4.



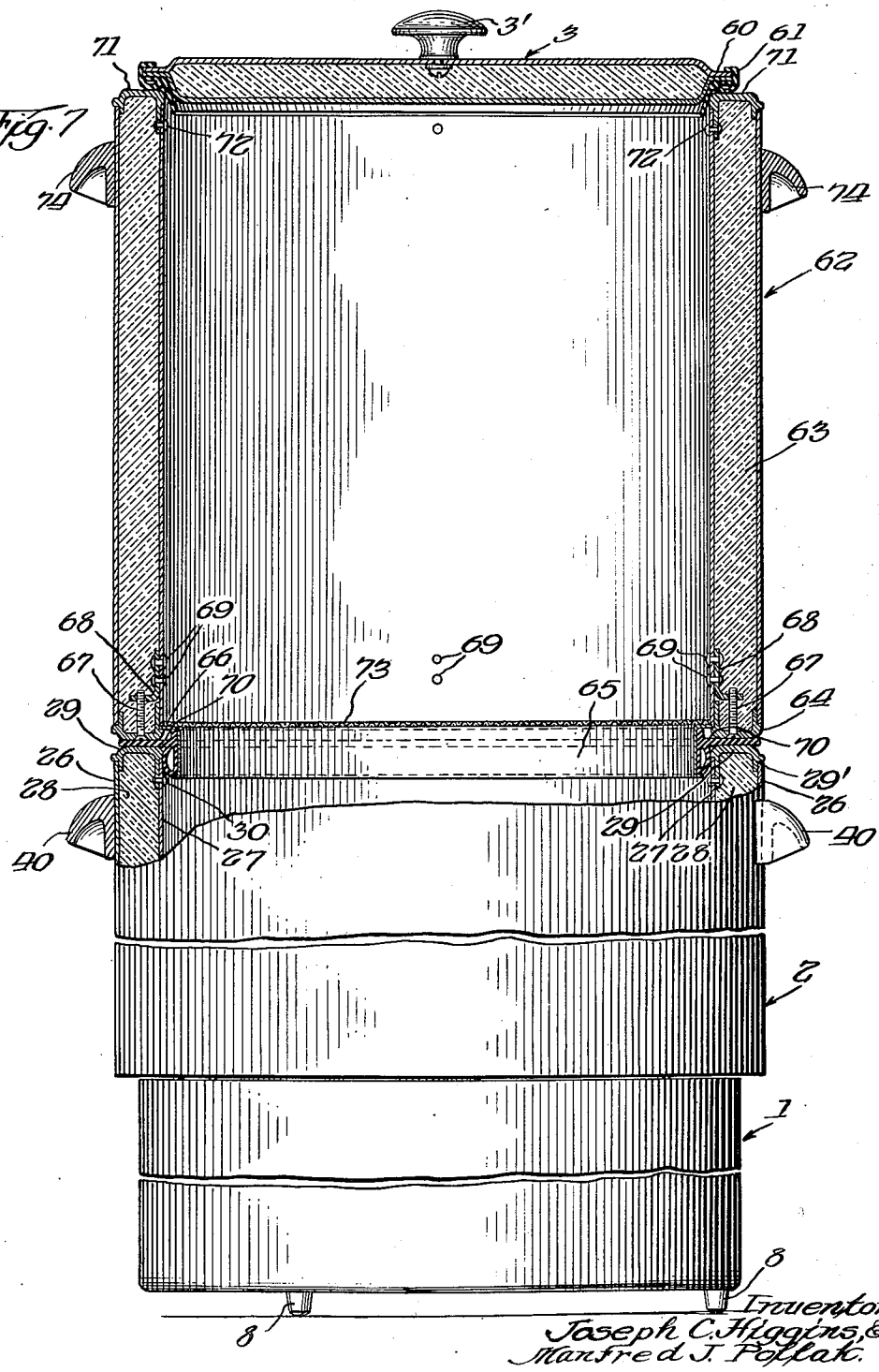
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PORTABLE REFRIGERATOR

Filed March 3, 1948 4 Sheets-Sheet 4

Fig. 7



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Patented Jan. 2, 1951

2,536,287

UNITED STATES PATENT OFFICE

2,536,287

PORTABLE REFRIGERATOR

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Application March 3, 1948, Serial No. 12,867

7 Claims. (Cl. 62—116)

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This invention relates to improvements in automatic refrigerators; particularly, to those types of refrigerators employing mechanisms for compressing, condensing and circulating a cooling medium whereby to effect and maintain adequate refrigerating temperatures within the storage compartments thereof.

More particularly, it is an object of the invention to provide a refrigerator whose construction, design and size are such that the same is conveniently and easily portable; will occupy but a minimum of space yet provide a maximum of refrigerated storage area, and is of pleasing and ornamental appearance.

It is also an object of the invention to provide a constructionally cheap, practical and sturdy form of housing for the refrigerator, affording novel operating mechanism receiving and refrigerating compartments, each of which are conveniently and quickly accessible.

A further object of the invention is to provide a portable refrigerator whose refrigerating or storage compartment or chamber has an advantageous and novel form of article support adjustably and removably received therein and usable in a manner to facilitate convenient and immediate access thereto for selective placement and/or selective removal of articles on and from the same.

Yet another object of the invention is to provide a refrigerator whose refrigerating chamber and article supporting means are so constructed and so relatively arranged as to ensure thoroughly effectual and constant refrigerating temperatures in and throughout the chamber whereby to effect positive and efficient preservation of foodstuffs, etc., placed therein and thereon.

A still further object of the invention is to provide a refrigerator of the character above stated, whose refrigerating area or storage chamber may be easily, quickly and simply increased in size, at the option of a user, as and when desired, all without detrimentally affecting its operating efficiency, its compactness, it space occupying requirements, or its attractiveness of appearance.

Another and equally important object of the invention is to provide a refrigerating housing whose operating mechanism receiving and retaining compartment is constructed to effect and maintain a uniform exchange of air therethrough and the coursing of such air in a manner whereby to positively contact the condensing means of such operating mechanism; moreover, to support the operating parts of the mechanism in a firm and entirely secure manner and to prevent the

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transmission of objectionable and/or detrimental vibratory movement to the storage compartment of the refrigerator.

The foregoing, as well as other objects, advantages and meritorious teachings of our invention, will be in part obvious and in part pointed out in the following detailed disclosure thereof, when taken in conjunction with the accompanying drawings, it being understood that the form of invention presented herein is precise and what is now considered to be the best mode of embodying its principles, but that modifications and changes may be made in specific embodiments without departing from its essential features.

In the drawings:

Figure 1 is a vertical transverse section through the improved refrigerator, taken on the line 1—1 of Figure 2, looking in the direction in which the arrows point.

Figure 2 is a top plan view of the same with the cover or lid removed.

Figure 3 is a transverse section taken on the line 3—3 of Figure 1, looking in the direction in which the arrows point.

Figure 4 is a fragmentary vertical transverse section taken through the lower housing of the refrigerator, showing the mechanical refrigerating assembly therein, together with a portion of the bottom of the refrigerator upper housing.

Figure 5 is an enlarged detail in vertical section through a form of supporting and handling device for use in connection with the refrigerator evaporator or freezing member.

Figure 6 is a transverse section taken on the line 6—6 of Figure 5, looking in the direction in which the arrows point, and

Figure 7 is a fragmentary elevational view, partly in section, showing an extension compartment for use in connection with the upper housing of the refrigerator whereby to increase its cubic content area.

Referring in detail to the drawings, the improved refrigerator, generally, comprises a cross-sectionally circularly shaped lower or base housing 1 constructed of suitable sheet material, as for example, aluminum, steel, plastic, etc.; a refrigerating housing 2, preferably of cross-sectionally circular shape and of a diameter and height somewhat greater than the housing 1, also made of sheet material, as above, and a cover or lid 3 for its open upper end.

The lower housing 1 receives and supports therein a mechanical refrigerating assembly, including a motor-compressor 4, a condenser 5 and

a capillary coil 6, all interconnected and intercommunicating, as hereinafter described.

The lower end of the lower housing is formed with a continuous and inwardly disposed lateral supporting flange 7 having relatively spaced feet 8 fixedly received on its under side. The upper end of the housing is completely open.

A substantially U-shaped sheet-like bracket 9 is received within the housing 1, being fixedly connected at its flanged upper ends 10 to appropriate portions of the lower side of the bottom (hereinafter described) of the upper housing 2. Vertical legs 11 are connected, as at 12, to an extended end portion of the horizontal base of the bracket 9 and have supporting bearing on adjacent portions of the lateral flange 7 of the housing 1 (see Figures 1 and 3 of the drawings). A sheet-like rectangular leg 13, having its opposite ends flanged, as at 14, is received and vertically disposed within the housing 1 and, as shown in Figures 1 and 3 of the drawings, is arranged at substantially right angles to the opposite and vertical sides of the U-shaped bracket 9 at a point in proximity to the remaining end of its horizontal base, i. e., opposite the vertical legs 11. The flanged lower end of this leg 13 is suitably engaged with and connected to portions of the lateral supporting flange of the housing 1, while its upper flanged end 14 is secured to appropriate portions of the above indicated bottom of the upper housing 2. Thus, it is apparent that said housing 2 will be effectually and firmly supported by and from the lower housing 1 in vertically spaced relation thereto; moreover, that the horizontal base of the U-shaped bracket 9 affords an effectual support for the motor-compressor 4, as presently described. If desired, the rectangularly shaped leg 13 may be of reticulated formation, whereby to offer the least possible impedance to the passage and circulation of air into and through the lower housing 1.

In order that the motor-compressor 4 will be securely supported by the bracket 9 within the housing 1, the basal portion of said bracket is formed with a circular opening of shape and size such as to permit of snug reception of the lower part of said motor-compressor therein and therethrough; an annular and upwardly extending flange 15 being formed on said basal portion of the bracket 9 about said opening whereby to snugly engage about an adjacent portion of the member 4, in a manner indicated in Figures 1, 3 and 4 of the drawings. A cup-like retainer 16 receives therein and supports the basal portion of the motor-compressor 4, and is securely though detachably connected to the base of said bracket 9, by means of screws 17 or other suitable fastening devices. At this point, it should be noted that the spacing of the base of the U-shaped bracket 9 above or from the lateral flange 7 of the lower housing 1 is such as to effectually accommodate the lower and extended end portion of the motor-compressor 4, and too, to effect its complete enclosure or reception within said lower housing 1.

The condenser 5, preferably of circulating coil and heat dissipating construction, is provided with a supporting frame 18. Said condenser, with its frame 18, is received within the housing 1 in a somewhat oblique position. Bracket plates 19, connected at and along their opposite sides to appropriate portions of the sides of the frame 18, as at 20, are extended from the condenser frame 18 inwardly into juxtaposed relation to and engagement with the inner sides of the vertical leg or extension portions of the U-shaped bracket 9 and are fixedly connected thereto by screws, bolts or other appropriate securing devices 21. In consequence, it will be seen that a firm and solid supporting of the condenser 5 by and from the U-shaped bracket 9 is effected.

A cooling medium supply and circulating pipe 22 is connected to and communicates with the outlet port of the motor-compressor 4 and with the inlet port of the condenser 5. A second and outlet pipe 23 is connected to the outlet end or port of the condenser 5 and extends through the lower portion of the lower housing 1, and thence upwardly into engagement, by means of a suitable reducer fitting 24, with the adjacent end of the vertically positioned capillary coil 6 also within said lower housing 1. The upper end of the capillary coil 6, whose cross-sectional area is less than that of the pipe 23, for reasons well understood in the art, extends upwardly from and beyond the open upper end of the housing 1, as indicated at 25, and passes through the hereinbefore indicated bottom of the upper housing 2 into engagement and communication with the refrigerator evaporator, to be presently described.

The refrigerating housing 2 consists of a tubular cross-sectionally circular body or shell 26 open at its opposite ends, having a second and similar body or shell 27 arranged within and concentrically of the same. Both bodies may be made of aluminum, steel or other material, or they may be constructed of a suitable plastic material. If made of metal, their exposed surfaces may be paint, porcelain or otherwise coated or finished, while if of plastic, they may be suitably colored, such as conditions or preference may dictate.

The diameter and height of the body 26 is greater than that of the body 27, whereby the latter will be completely received within the former and a circumferential spacing will be effected entirely thereabout. Heat insulating material 28 is arranged in this circumferential space, for an obvious purpose.

The space between the upper and juxtaposed ends of the upper housing shells 26 and 27 is closed by a ring 29, of metal or other suitable material, having annularly flanged and shouldered opposite sides 29'. Said ring is snugly received in said space and is locked therein by engaging rivets 30, or their equivalents, through the inner annular flange 29' and adjacent portions of the body 27 (see Figures 1 and 7). Thus, the heat insulation 28 is protected, and also, the upper end portions of the shells 26 and 27 are fixedly retained in spaced relation, irrespective of the insulation 28 therebetween.

A bottom, or specifically, an inner bottom 31 consisting of a circularly shaped sheet of metal, plastic or other suitable material, of a diameter greater than that of the shell 27, but less than the diameter of the shell 26, is positioned adjacent and engaged over the lower end of the shell 27, which, as will be noted on reference to Figure 1 of the drawings, is spaced upwardly of the lower end of the shell 26. This inner bottom 31 is formed or otherwise provided with a downwardly extending marginal annular perforate flange or collar 31', whose lower end is laterally flanged, as at 32. By means of said inner bottom and its collar 31' and flange 32, the lower ends of the shells 26 and 27, are effectually closed and bridged; additionally, the adjacent end of the heat insulation 28 is covered and protected, and the lower portions of said shells are fixedly retained in spaced relation. It will be here noted that fixed connection is effected between the in-

ner bottom 31 and the lower end of the shell 27 by means of angle brackets 33, which are fastened to appropriate adjacent portions of said bottom and shell by fastening devices 34 and 35.

It is preferable that the inner bottom 31 shall be so formed as to incline toward its center from the outer marginal portions thereof whereby to effect, at times, the positive collection and retention of condensed moisture which may become present during operation of the improved refrigerator.

Heat insulation 28', of suitable thickness, is placed beneath and in contact with the entire lower surface of the inner bottom 31 and is bonded or united with the heat insulation 28 between the shells 26 and 27 by passing through the perforations in the collar 31'.

A primary or lower bottom 36, consisting of a circularly shaped sheet of metal, plastic or other suitable material of gauge or thickness greater than that of the inner bottom 31, is arranged within the open lower end portion of the shell 26, and as shown in Figure 1 of the drawings, is engaged completely over or covers the entire lower surface of the heat insulation 28'. This lower bottom 36, as is also clearly shown in said Figure 1 of the drawings, is of a size or diameter such as will permit its rather snug reception within said open lower end of the shell 26, and hence, it extends completely over the flange 32 of the collar 31' into contact with or proximity to the adjacent inner surface portion of said shell 26. Angle brackets 37 are arranged, in relative spaced relation, about the inner side of the lower portion of the shell 26 and are fixedly connected to adjacent portions of said shell by bolts 38, or their equivalents. Said angle brackets 37 also have fixed connection with the lower or primary bottom 36 and portions of the flange 32 of the collar 31', by means of screws 39 passed through adjacent portions of said lower bottom 36 and flange 32 into threaded engagement with appropriate openings in adjacent portions of said brackets. It will be therefore seen and appreciated that firm, secure and solid connection will be effected between the bottom structure and the side wall structure of the upper housing 2.

Hand holds 40, or their equivalents, are fixed to upper portions of the outer side of the upper and refrigerating housing 2, for an obvious purpose.

To provide refrigerating temperatures within the upper housing 2, an evaporator 41 is fixedly mounted therein, preferably resting on its inner bottom 31 adjacent a portion of its inner side wall, as constituted by the shell 27 (see Figures 1 and 2). Said evaporator comprises a cross-sectionally rectangularly shaped and somewhat elongated receptacle, open at the top, whose side walls and bottom are hollow and channeled by means of baffle-depressions 41 therein, whereby to effect and maintain in and therethrough a circulatory turbulence of the refrigerant fluid supplied from the capillary coil 6 in the lower housing 1. To improve or increase the operational efficiency of the evaporator 41, wing-like plates 42 and 42' are extended upwardly and laterally from the normally outer side wall thereof, in the manner shown in Figures 1 and 2 of the drawings. Said plates extend to a point near but below the open top of the housing 2 and are juxtapositioned with relation to the aforesaid portion of its inner side wall. The relative positioning of these plates 42 and 42', on the evaporator 41, is such that whereas they will increase the refrigerating potential thereof, they will not interfere with or impede convenient and full access to its interior. Refrigerant fluid inlet and outlet ports are formed, respectively, in the evaporator bottom and the upper free end of the plate 42. The extended portion 25 of the capillary coil 6 is connected to the inlet port, while a fluid return pipe 43 is connected to the outlet port and extends downwardly therefrom through the bottom structure of the upper housing 2 into and through the lower housing 1 where it is connected to the fluid return port or fitting of the motor-compressor 4, as at 44.

With a view toward providing means for conveniently and effectually supporting matters to be refrigerated within the refrigerating chamber of the upper and refrigerating housing 2, we provide a tray-like device which consists of a semi-circularly shaped bottom 45 made of suitable sheet material, as for example, metal, plastic, etc., whose outer marginal portion is upwardly flanged or rimmed, as at 45', and whose body is formed with a plurality of interconnecting radially and circularly disposed upwardly directed depressions or ribs, generally identified by the numeral 46. A vertically disposed lifting rod 47 has its lower end connected to an intermediate or substantially central portion of the semi-circularly shaped bottom 45, as indicated at 48. The height or length of this lifting rod 47 is somewhat less than the height of the refrigerating chamber within the upper housing 2, and a handle or knob 49 is affixed to its upper and free end. The diameter of the semi-circularly shaped bottom 45 of the tray device is such as will permit of its rather snug though convenient reception in the refrigerating chamber of the upper housing 2 and, of course, its supporting contact and engagement with the inner bottom 31 thereof, as shown in Figures 1 and 2 of the drawings.

Obviously, the tray device may be, as desired, removed or partially removed from the refrigerating chamber of the upper housing 2 by engaging the knob 49 of the lifting rod 47, and then drawing the device upwardly from or through the open upper end of said upper housing 2.

A plurality of complementally constructed and shaped wire baskets or containers, generally identified herein by the numeral 50, are provided to the upper and refrigerating housing 2. It will be noted that these baskets 50 are of segmental cross-sectional shape, and hence, that two of the same may be arranged on the semi-circularly shaped bottom 45 about the centrally located lifting rod 47. The upper and open ends of each of these baskets are outwardly flared, as at 51. In consequence, tiers of such baskets may be stacked on the tray device in relative nested engagement and relationship, in the manner clearly shown in Figure 1. The lower or bottom portions of the upper baskets will, obviously, be nestingly engaged and retained in the outwardly flared portions 51 of the open upper ends of those baskets immediately therebelow, and hence, will be prevented from having undesirable lateral shifting movement, one with relation to the other. Various matters may, as will be understood, be placed in the wire baskets 50 received and supported on the bottom 45 of the tray device, whereupon said device is then lowered into the refrigerating chamber of the upper housing 2.

Because of the semi-circular shape and size of the bottom 45 of the tray device, it will be seen that it may be lowered into or moved upwardly through the refrigerating chamber of the upper housing 2 by the walls of the evaporator

41, without interference; it being noted in this connection that the segmentally shaped cut-away portion of said bottom substantially embracingly engages about said walls of the evaporator, in the manner clearly shown in Figure 2 of the drawings. The flanged or rimmed outer marginal portion 45' of the tray device bottom 45 functions to prevent lateral displacement of the wire baskets, and particularly, the lowermost of these baskets, from said bottom.

It may be also here noted that by reason of the ribs 46 in the bottom 45, a minimum of contact is effected between the same and the bottoms of the lowermost wire baskets 51; therefore, that adhesion of such baskets to the tray device bottom, as by freezing, etc., will be reduced to strictly minimum.

If it is desired to freeze water or other fluid within the evaporator 41, a second tray-like device, such as illustrated by Figure 5 of the accompanying drawings, may be employed. Said device consists of a sheet material constructed perforated bottom 52, marginally flanged or ribbed, as at 53. The shape and size of this bottom 52 is such as will permit of its rather snug and slidable reception within the cross-sectionally rectangularly shaped evaporator 41, via its open top. A lifting rod 53, of suitable length and knobbed on its free and upper end, as at 54, has its lower end fixedly connected to an intermediate portion of the bottom 52, as at 55. The length or height of this lifting rod 53, preferably, is greater than the height of the evaporator 41, in order that convenient engagement therewith may be effected. A plurality of perforated trays 56, of shape and size corresponding to that of the bottom 52, are fixedly secured, in substantially equi-spaced vertical relation, to the lifting rod 53, as generally indicated by the numeral 57. The bottom 52 and each of the trays 56 may be and preferably are formed with upwardly pressed ribs 58, the purpose of which will be presently described.

A plurality of flexible plastic cups 59, four to a tray 56 and bottom 52, are provided for use in connection with the above described and second tray-like device. Water or other liquid or matter may be placed in the cups 59 which are then placed on the bottom 52 and the tray 56 in the manner indicated in dotted lines in Figure 6 of the drawings, whereupon said tray-like device is lowered into the evaporator 41 until its bottom 52 comes into supporting engagement with the evaporator bottom. The contents of said cups 59 may be frozen or congealed to the particularly desired degree. When it is desired to remove the same, the knob 54 of the lifting rod 53 of said tray-like device, and the device, is then drawn upwardly from and out of the evaporator 41. Since the cups 59 will rest on the ribs 58 of the bottom 52 and trays 56, it will be understood that a minimum of contact is effected, and thus, their adhesion, as by freezing thereonto, will be reduced to minimum; thus, the cups may be conveniently and readily moved and flexed for removal of their congealed or frozen contents, as required.

A circular cover or lid, hereinbefore identified by the numeral 3, is provided for the open upper end of the upper and refrigerating housing 2. It consists of relatively opposed and circularly shaped sheet material constructed bodies, of appropriate size, flanged at and about the marginal portions thereof, as indicated at 60. These flanged portions are interconnected by welding or other suitable means, whereupon a rubber or other suitable form of packing strip, generally indicated by the numeral 61, is engaged with the interconnected flanged portions 60. The flexible packing 61, obviously, serves to effect an airtight or sealing removable connection as between the cover or lid 3 and the receiving upper end portion of the upper housing 2—particularly, its closure ring 29. It is preferable that the outer side of the cover 3 shall be provided with a suitable knob 3', or its equivalent, for an obvious purpose.

In Figure 7 of the accompanying drawings, we have shown an extension device, generally indicated by the numeral 62, for the upper and refrigerating housing 2 of our improved refrigerator. The utility of this device 62 is to increase the contents storage area of said upper housing 2 whereby a greater amount of matter, for refrigeration, may be stored.

The extension 62 consists of a double walled cross-sectionally circularly shaped tubular body, whose inside and outside diameters correspond to those of the upper and refrigerating housing 2, and whose height may correspond or vary, such as conditions or preference may dictate. Heat insulation 63 is arranged between the inner and outer walls of the extension and said walls may be and preferably are constructed of materials like those of the shells 26 and 27 of the upper housing 2.

A channeled ring-like and shouldered closure 64 is engaged with and over the normally lower end of the extension 62 and the adjacent end of the heat insulation 63. An annular coupling neck 65, whose diameter is less than the inside diameter of the upper housing 2 and the extension 62, is positioned adjacent and in said normally lower end of the extension and has the outer portion of its laterally flanged upper end 66 clampingly secured between the lower end of the extension inner wall and the adjacent shoulder of the closure ring 64. Connecting screws 67 are passed through spaced portions of the closure ring 64 upwardly through the heat insulation 63 between the extension walls and are threadedly engaged with angle brackets 68 secured, as at 69, to the lower end and outer side portions of the extension inner wall. The closure ring is thus fixedly connected to the extension, and moreover, its shoulder engaging the flanged upper end 66 of the coupling neck 65 is securely clamped thereon.

A circular sealing gasket 70, of rubber or other suitable material, is snugly engaged over and about the outer periphery of the coupling neck 65 and ensures the making and maintaining of a fluid-tight connection (for obvious reasons) between the lower end of the extension 62 and the upper end of the upper and refrigerating housing 2 when the former is superimposed on the latter, in the manner shown in Figure 7 of the drawings.

The upper end of the double walled extension 62 has a channeled ring-like and shouldered closure 71 engaged with and over the same and adjacent portions of the heat insulation 63. The side walls of said closure 71 are snugly received between the extension walls, and its shouldered portions abuttingly engage the adjacent ends of the extension walls. Rivets 72 are engaged through appropriate and adjacent portions of the inner wall of the closure 71 and the extension inner wall and fixedly secure said closure in its assembled relation.

When the extension 62 is superimposed on the

upper and refrigerating housing 2, the cover or lid 3, which has been removed from the latter, is closingly engaged with and over the upper end of said extension.

If desired, a circularly shaped wire constructed or other form of reticulated piece 73, whose diameter is greater than that of the coupling neck 65, is removably laid on and over the upper end of said neck. It will provide an effectual bottom for the extension 62, and so, will satisfactorily support articles and/or matters placed therein, allowing convenient access to be had to the interior of the upper housing 2, in that said extension 62 can be unitarily removed therefrom without disturbing its particular contents.

A tray-like device and its container accessories, similar to that hereinbefore described and used in the upper housing 2, may be advantageously used in the extension 62.

Hand holds 74 may be and preferably are provided to the extension 62 for an obvious purpose.

The operation and mode of usage of the refrigerator, it is believed, will be understood from a reading of the foregoing description. However, in general review thereof, it may be stated that a sufficient quantity of refrigerating fluid is supplied to the mechanical refrigerating assembly, heretofore described. The motor-compressor 4 is operated, causing said fluid to be compressed thereby and expelled from the same in gaseous form via the pipe 22 into and through the condenser 5, where it is condensed and liquified, then discharged in fluid form (under adequate pressure) through the outlet pipe 23 into and through the capillary coil 6, thence, at a materially reduced pressure, into and through the channels of the evaporator 41 and its wing-like plates 42 and 42'. Heat exchange is effected within the chamber of the upper and refrigerating housing 2, and thereby, the temperature of said chamber is suitably lowered and maintained. Following circulation of the liquid refrigerant through the evaporator and its plates, the same is outletted into the return pipe 43 and returned to the motor-compressor 4 for recompression, etc.

The refrigerating temperature within the chamber of the refrigerating housing 2 may be either increased or decreased, as desired or required, by increasing and/or prolonging the period and velocity of operation of the motor-compressor 4.

An adequate and continuous supply of air is provided to the refrigerating assembly within the lower housing 1, such air and its exchange being into and from said lower housing through the way or annular port at the top thereof, i. e., the annular space between the top of the lower housing 1 and the bottom of the upper housing 2 which is supported on and by said lower housing, and through the open lower end of the lower housing.

In normal use of the refrigerator, only the refrigerating housing 2 is employed. Articles or matters to be refrigerated may be placed in the wire baskets 50 or certain ones thereof. These baskets may then be arranged on the bottom 45 of the tray-like device which is lowered into the chamber of said housing. Access may be selectively had to the basketed refrigerated matters by removing the closure or lid 3 from the refrigerator housing 2, engaging the knob 49 of the tray-like device lifting rod 47, and raising the same to effect its removal or partial removal. Obviously, if it is desired to have access to certain of the upper baskets 50, the tray-like device need be lifted only to a height sufficient to expose the same above the open end of the upper housing 2.

Should it be desired to place and refrigerate articles of larger bulk and size within the refrigerating housing 2, the above referred to tray-like device and the wire baskets 50 may be removed therefrom.

On those occasions when a refrigerating area or space greater than that of the refrigerating housing 2 is required, the extension device 62 is endwise engaged and mounted on the upper end of said housing following removal of the lid therefrom and its placement over the upper open end of said device, as shown in Figure 7 of the drawing. To effect a greater heat exchange, and hence, adequate refrigeration of this increased refrigerating chamber area, the operation of the refrigerating assembly is accordingly stepped-up.

During use of the extension device 62, as above, it may become desirable to support or retain articles or matters therein independently of the upper and refrigerating housing 2. In such an event, the reticulated piece 73 is placed or supported on the upper side of the coupling neck 65, and so, will provide a bottom for the extension. Hence, it is then possible and practicable to unitarily remove said extension and its contents from the upper housing 2 in order that access may be had to the latter.

It will be understood and appreciated that whereas water may be cube frozen in the various flexible cups 59 on the tray-like device 52—53—54—56, when the latter is placed in the evaporator 41, various other matters may be placed in said evaporator and on said device, or the device may be removed from the evaporator and matters placed directly therein.

While we have herein shown and described our improved portable refrigerator as being cross-sectionally circular in shape, the same may be constructed in other and different cross-sectional shapes, viz., cross-sectionally rectangular, etc., without in any manner departing from the spirit and scope of the invention. Moreover, the materials from which the housings 1 and 2 and the extension device 62 are made, may be widely varied, or different combinations of construction materials may well be used for their production or productions.

At those times when it shall become desirable to defrost the interior of the upper and refrigerating housing 2, operation of the mechanical refrigerating assembly may be ceased or reduced to a minimum, thus lowering the internal temperature of said housing. Thereupon, melting of the frost or ice within the refrigerating chamber of this housing will be effected and the liquid resulting therefrom will flow to its bottom and will collect substantially centrally of the more or less cupped bottom member 31, away from the points of connection of said bottom member with the housing shell 27, and so, avoid possible seepage of the same thereby into engagement with the heat insulation 28. The thus collected liquid may be readily removed by tilting or inverting the housing 2 along with the housing 1 to such an angle as to cause its immediate pouring from the open upper end of the housing 2. Additionally, it may be here noted that by reason of a minimum area contact between the bottom member 45 of the tray-like device and the lowermost wire baskets 50, adhesion of said baskets, by freezing or frosting, will be reduced to minimum, and so, such baskets may

be freely and easily removed, as and when desired. By the same token, due to the formation of the bottom of the evaporator 41, a minimum of engagement or contact will be effected between said bottom and the bottom 52 of the tray-like device provided for reception in the evaporator.

We claim:

1. In a refrigerator, a housing including walled bodies, one of said bodies having a bottom and a way therein for access to its interior, a closure for said way, the other of said bodies having an open end, and means in and supported by the other body at the bottom thereof extended from its open end and supporting said first body in spaced relation thereto.

2. In a refrigerator, a housing including walled bodies, one of said bodies having a bottom and a way therein for access to its interior, a closure for said way, the other of said bodies having open ends, and means in and supported by said other body at the bottom thereof extending from its upper open end and supporting said first mentioned body in vertically spaced relation thereto.

3. In a refrigerator, a housing including relatively vertically opposed walled bodies, the upper one of said bodies being of a cross-sectional area greater than the lower of said bodies and having a bottom and a way formed therein for access to its interior, a closure for said way, the other of said bodies having an upper open end spaced from the bottom of the upper body, and means in and connected to said other body at the bottom thereof extended from its open end supporting said first mentioned body in vertically spaced relation thereto.

4. A refrigerator, comprising a walled housing having operating mechanism receiving and refrigerating compartments, an evaporator in the refrigerating compartment communicating with the operating mechanism in the operating mechanism receiving compartment, and certain of the walls of said evaporator being vertically and horizontally extended, said extensions being arranged in juxtaposed relation to portions of the inner surface of the walls of the refrigerating compartment.

5. A refrigerator, comprising a lower housing and an upper housing, said upper housing having a bottom therein and a way in the same for access to its interior, a closure for said way, an evaporator in the upper housing, wing-like plates extended upwardly and laterally from the outer wall of said evaporator and juxtapositioned with relation to adjacent portions of the upper housing wall, said lower housing having an open upper end, a mechanical refrigerating assembly in said lower housing connected to and communicating with the evaporator in said upper housing, and means in said lower housing connected to the same and extending through its open end engaged with and supporting said upper housing.

6. A refrigerator, comprising relatively vertically opposed upper and lower housings, means in and connected to said lower housing engaged with and supporting said upper housing thereabove, a mechanical refrigerating assembly in said lower housing, said upper housing having a refrigerating chamber within the same, an evaporator in said refrigerating chamber connected to and communicating with said refrigerating assembly in the lower housing, wing-like plates extended upwardly and laterally from the outer wall of said evaporator and juxtapositioned with relation to adjacent portions of the upper housing wall, and means removably received in the refrigerated compartment of said upper housing for receiving and supporting articles thereon.

7. A refrigerator, comprising relatively vertically arranged lower and upper housings, said upper housing having a refrigerating compartment therein formed with an opening for access thereto, a closure for said compartment, said lower housing having an open upper end spaced from the bottom of the upper housing, supporting means in said lower housing, portions of which are extended through and above its open upper end and supportingly engaged with an adjacent portion of said upper housing for supporting the same in spaced relation thereto and to its said open upper end, a mechanical refrigerating assembly within said lower housing partially supported by said supporting means in the same, an evaporator in the refrigerating compartment of said upper housing connected to and communicating with said refrigerating assembly, and wing-like plates extended upwardly and laterally from and beyond the outer wall of said evaporator and juxtapositioned with relation to adjacent portions of the upper housing wall.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,162,945	Evans	June 20, 1939
2,273,948	Forslund	Feb. 24, 1942
2,319,522	Schweller	May 18, 1943
2,356,778	Morrison	Aug. 29, 1944