

Dec. 6, 1938.

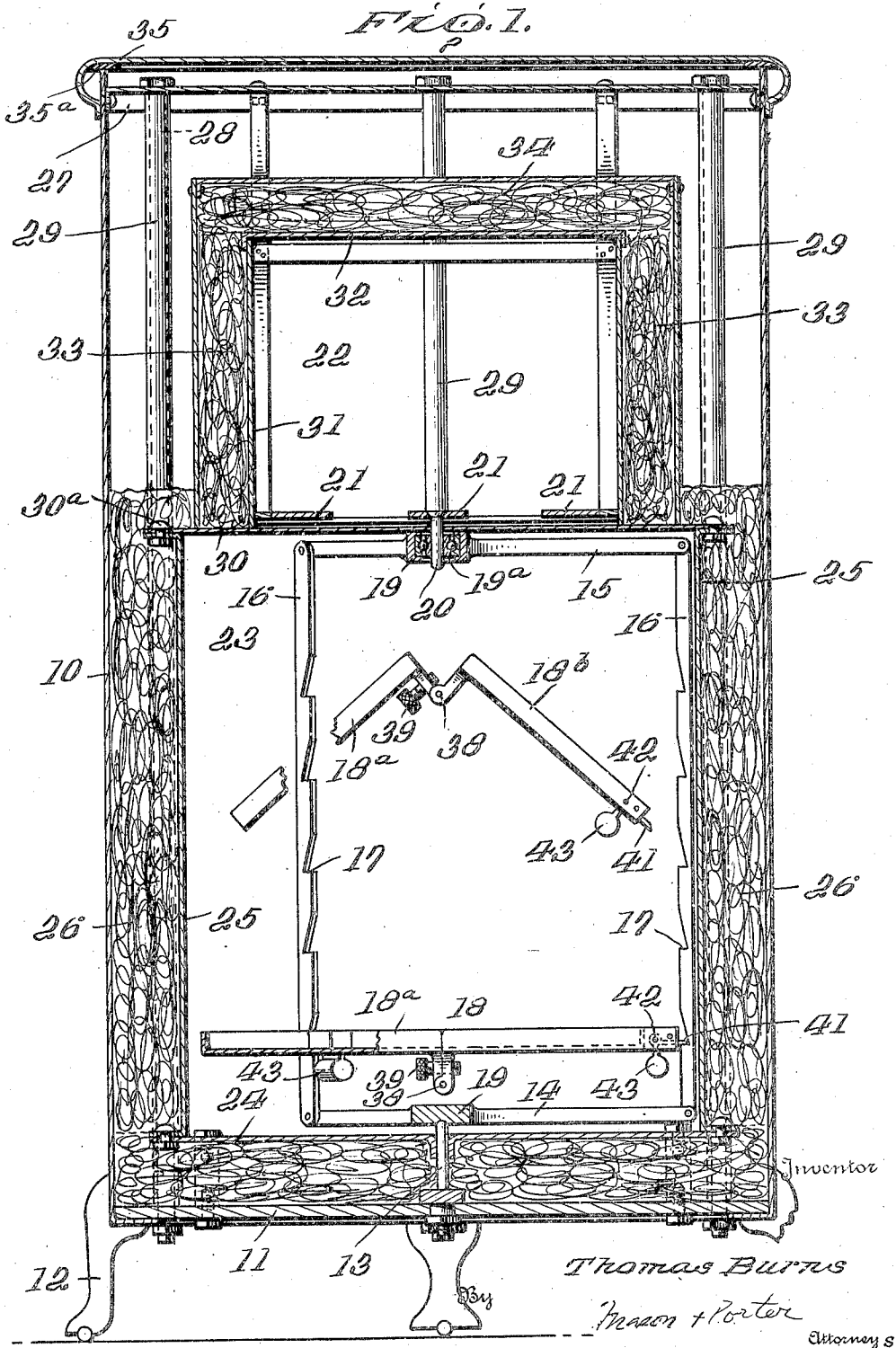
T. BURNS

2,139,184

REFRIGERATOR

Filed Feb. 24, 1937

3 Sheets-Sheet 1



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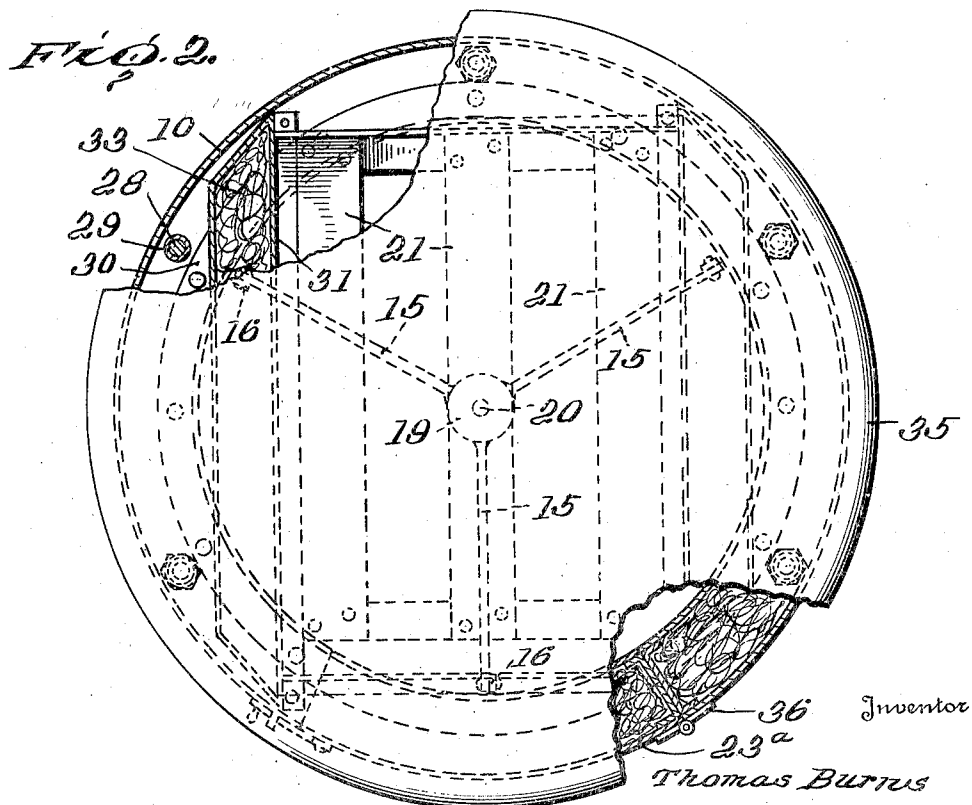
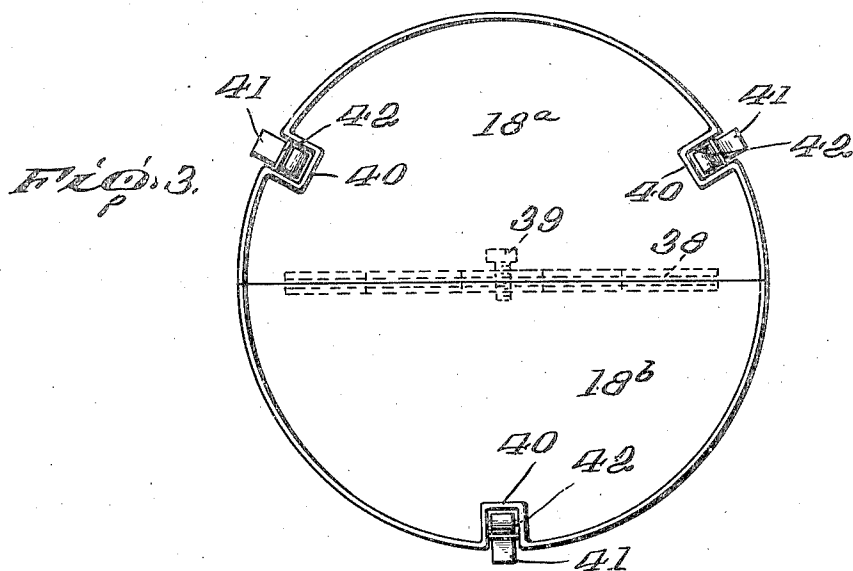
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REFRIGERATOR

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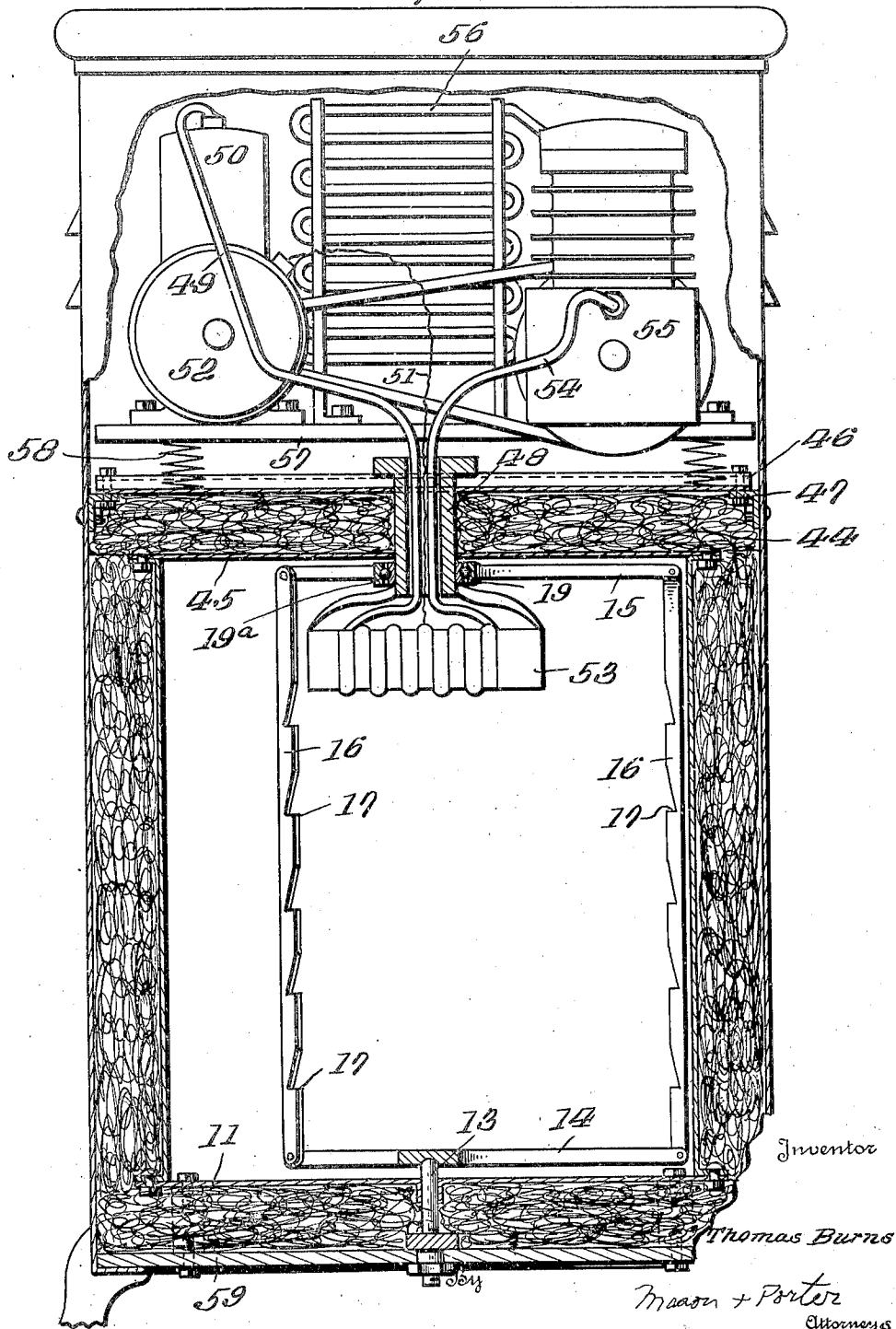
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FIG. 4.



UNITED STATES PATENT OFFICE

2,139,184

REFRIGERATOR

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3 Claims. (Cl. 62—89)

The present invention relates to refrigerators.

According to the present invention a shelf structure for the goods to be treated is rotatable within a casing and below a refrigerator unit which is stationary and is mounted in the top of the casing, doors being provided whereby the goods, independent of their relative positions on the shelves are readily accessible.

The refrigerator unit may consist of an ice box or an absorption system unit, or again it may be of the compression type consisting of a motor, compressor and evaporator. Where it consists of an ice box the base of the latter may form the upper bearing for the rotatable shelf structure for the goods, a step bearing being provided in the base of the casing to constitute the lower bearing of the structure.

Where, however, the refrigerator unit consists of a compressor, motor, and evaporator the upper bearing for the shelf structure may consist of a tubular member, the outer surface of which constitutes the bearing element for the shelf structure, the high pressure pipe line to the evaporator coil, the connection from a thermostat to the motor and the low pressure pipe line to the compressor passing through said tube to interconnect the motor and compressor housed above the tube with the evaporator coil suspended below it by brackets preferably connecting the ends of the coil with the tube.

The whole of the upper compartment containing the refrigerating unit may be removed through a detachable top of the casing or again, the unit itself may be removed through said top.

The compartment housing the rotary shelf structure and the compartment for the refrigerating unit may be lined with the usual insulating material, that is to say, it may be surrounded on all sides by spaced walls with insulating lag between them, bolts passing from the top to the base of the casing to retain the top in position. If desired, an insulated wall may be provided between the upper and the lower chambers which is adapted to be detachably secured to the side walls of the casing by any desired means.

The invention is more particularly described with reference to the accompanying drawings, in which:—

Figure 1 is a sectional elevation of one form of construction wherein the refrigerator unit consists of an ice box.

Figure 2 is a corresponding top plan view partly in section.

Figure 3 is a detail of a shelf for supporting the goods to be treated.

Figure 4 is a corresponding sectional elevation of a modified form of construction wherein the refrigerator unit consists of a compressor, motor and evaporator.

In the construction according to Figures 1-3 of the drawings, a casing 10 has a base 11 which is mounted on legs 12, the base being provided with a pivot or step bearing 13 for a rotary structure comprising lower and upper spider arms 14 and 15 respectively, and circumferentially spaced pillars 16 which are notched at 17 to receive one or more shelves 18.

The inner ends of the spider arms 14, 15, are connected to bosses 19, the boss of the lower arms 14 rotating about the pivot 13, the boss of the upper arms 15 being adapted for rotation through a ball race 19a relatively to the upper pivot 20 which is carried by the centre of three ice pan supports 21 forming the open base of an ice box 22 which is located above the compartment 23 within which the shelf supporting structure carrying the goods to be treated is adapted for rotation.

The compartment 23 has a false bottom 24 and sides 25 displaced between the bottom 24 and the base 11, and the annular space between the sides 25 and the casing 10 being filled with heat insulating lagging 26.

A rolled angle member 27 is provided to fit inside the top of the casing and is maintained in spaced relationship from the base 11 by bolts 28 passing through distance pieces 29.

The top of the food compartment 23 is formed by a plate 30 which is bolted at its edges as at 30a, to the turned back upper ends of the inner walls 25.

The sides of the ice box are formed by supporting walls 31 which rest upon the side ice pan supports 21, while the roof of the ice box is shown at 32, said ice box being lagged at its sides and top as shown at 33 and 34 respectively. A lid 35 is provided which is preferably of sheet steel but is adapted to fit tightly through the intermediary of a rubber gasket 35a over the top of the casing.

A door 23a is provided to obtain access to the food compartment, this door being hinged to a vertically disposed channel member 36 which is secured at its top and bottom to the angle member 27 and the base respectively. A similar door may be provided for the ice box.

The position of the doors is shown in Figure 2, the upper door for the ice box being directly above the lower door for the food compartment.

Each of the shelves 18 is formed of two semi-

circular parts 18a, 18b, which are hinged as at 38, along a diametral line so as to permit of relative angular displacement of the halves to enable a shelf to be displaced out of engagement with one set of notches 17 and either elevated or lowered into another set of notches.

A locking screw 39 is provided to maintain the two half portions in uniplanar relationship when they are properly supported in position for receiving the food to be cooled. The periphery of each shelf is recessed at 40 to receive locking tongues 41 which are adapted for angular displacement about pivots 42 and carry counter-balance weights 43, the locking tongues 41 being adapted for engagement within the notches 17 to support the shelves in any desired position of adjustment.

As will be seen from the drawings, where three vertical pillars 16 are provided, each shelf has three locking tongues, the recesses being spaced apart by arcs each subtending an angle of 120°.

It will also be seen from the drawings that no matter how the food is arranged on the shelves, access to this is readily available on opening the door by rotating the food supporting structure.

In the modified form of construction illustrated in Figure 4, the top of the food compartment is lagged with heat insulating material 44 which is housed between a plate member 45 and a diametrically extending bridge member 46 of a channel section, the said bridge member being supported on an angle member 47 which is rolled to the internal contour of the casing 10 and is secured thereto such as, for example, by spot welding.

A collar bush 48 supported at its upper end by the channel bridge member 46 serves as a bearing for the boss 19 of the upper spider arms 15 of the food supporting structure. It also serves as a conduit for a high pressure pipe 49 from a liquid reservoir 50 of the refrigerator unit, for the thermostat connection 51 from a motor 52 to an evaporator 53 of said unit and for the lower pressure pipe 54 between the evaporator 53 and a compressor 55. The condenser of the unit is shown at 56.

The motor 52, liquid reservoir 50, condenser 56 and compressor 55 are carried by a frame 57 which through the intermediary of compression springs 58, preferably four in number, is supported on the member 47 or on the bridge member 46. In the latter event, a pair of bridge members 46 may be provided extending in directions normal to each other across the top of the food compartment.

If desired, a ball race 19a may be interposed between the collar bush 48 and the boss 19 of the upper spider arms 15.

As in the previous construction, the food chamber is isolated from the casing 10 by means of false sides and a false base with the annular spaces between the false sides and the casing filled with lagging of a heat insulating nature and with the false base maintained in spaced rela-

tionship from the base 11 by distance pieces 59 and the space taken up by insulating lagging.

In this construction as with that described in Figures 1-3, the food supporting structure is rotatable whereby access can be obtained to any article of food, irrespective of its position on the shelves, merely by opening the door and rotating the food supporting structure until the article concerned lies nearest the door opening.

I declare that what I claim is:—

1. In a refrigerator having at least one compartment, means providing upper and lower co-axial pivots in said compartment, upper and lower spider arms rotatable about said upper and lower pivots respectively, vertical pillars connecting the outer ends of said upper and lower spider arms and having notches formed therein at spaced intervals, at least one removable shelf formed of two half portions having pivoted fingers adjacent the periphery thereof for engaging said notches whereby to support the said shelf, said half portions of the shelf being shiftable out of alignment to permit disengagement thereof from said pillars, and means for maintaining said half portions of the shelf in horizontal alignment.

2. A refrigerator comprising an upper compartment, a refrigerating unit in said upper compartment, a lower compartment, means providing an upper vertical pivot depending from said upper compartment into said lower compartment, a co-axial lower pivot disposed in the bottom of said lower compartment, upper and lower spider arms rotatable about said upper and lower pivots respectively, vertical pillars connecting the outer ends of said upper and lower spider arms and having notches formed therein at spaced intervals, and a plurality of shelves adapted to be supported by said pillars and each of said shelves having pivoted fingers adjacent the periphery thereof adapted to engage the notches in said pillars whereby to support the shelves.

3. A refrigerator comprising, upper and lower compartments, a refrigerating unit consisting of a motor, compressor and condenser located in said upper compartment, and an evaporator disposed adjacent the top of said lower compartment, means providing an upper pivot extending into said lower compartment and having a central bore therethrough forming a conduit for connections between the evaporator and the motor, compressor and condenser, a lower pivot in said lower compartment disposed co-axially with respect to said upper pivot, upper and lower spider arms rotatable about said upper and lower pivots respectively, pillars connecting the outer ends of said upper and lower spider arms and having notches formed therein at spaced intervals, and a plurality of shelves adapted to be supported by said pillars and each of said shelves having pivoted fingers adjacent the periphery thereof adapted to engage the notches in said pillars whereby to support the said shelves.

THOMAS BURNS.