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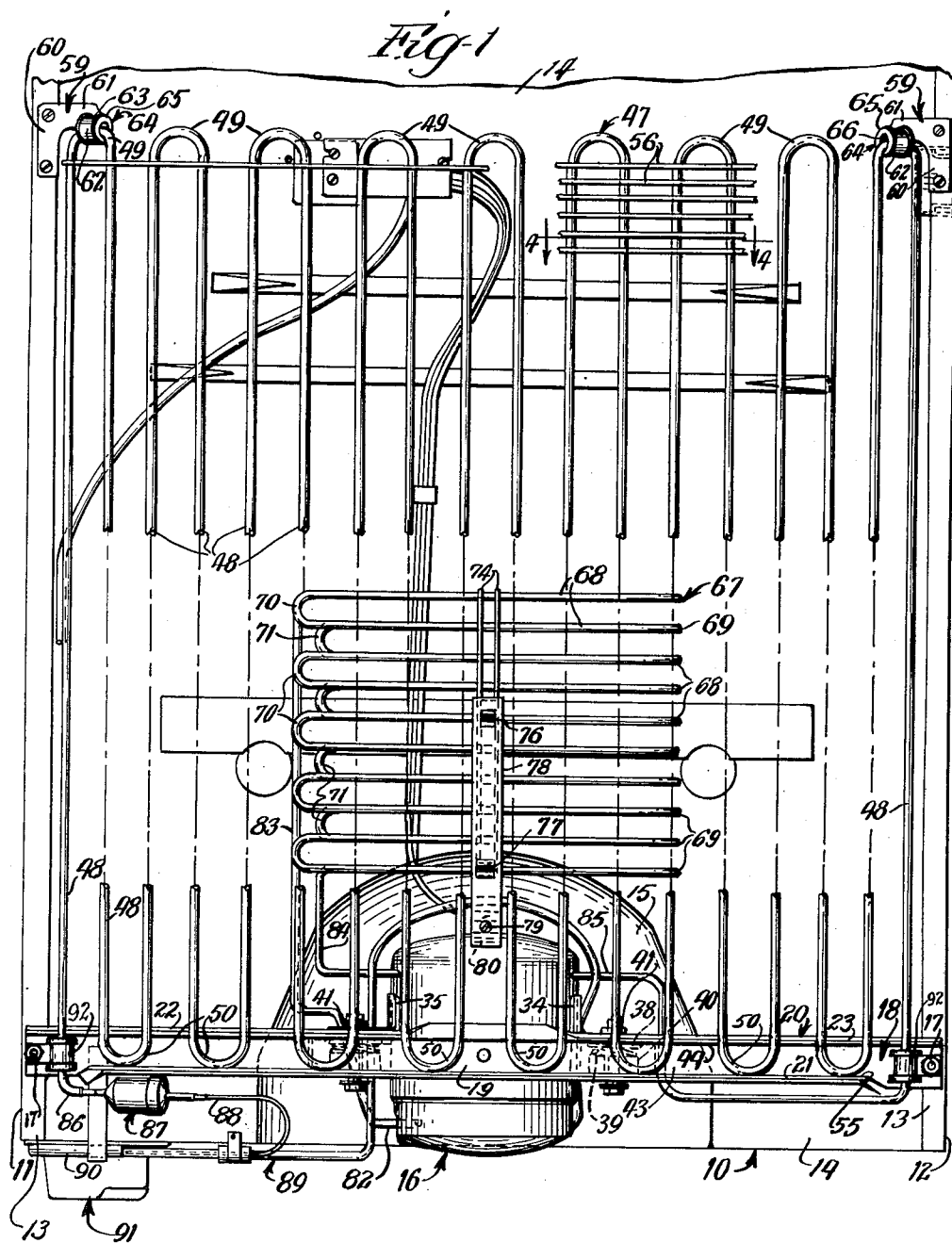
H. NADLER

2,687,625

WIRE CONDENSER IN REFRIGERATION SYSTEM

Filed June 17, 1952

2 Sheets-Sheet 1



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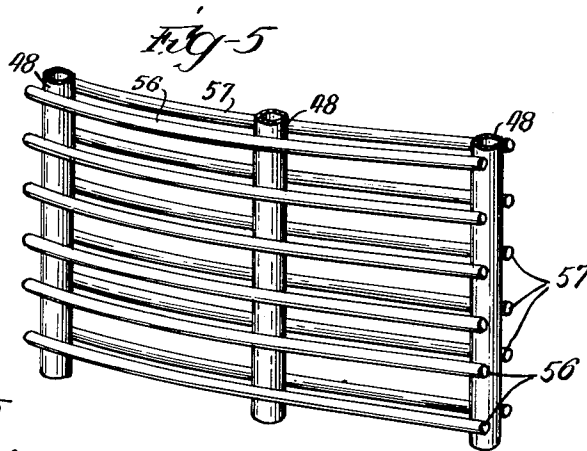
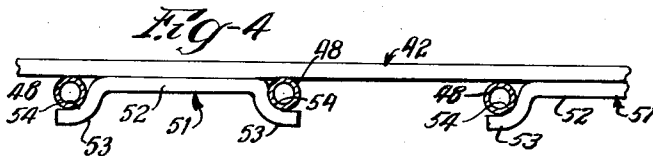
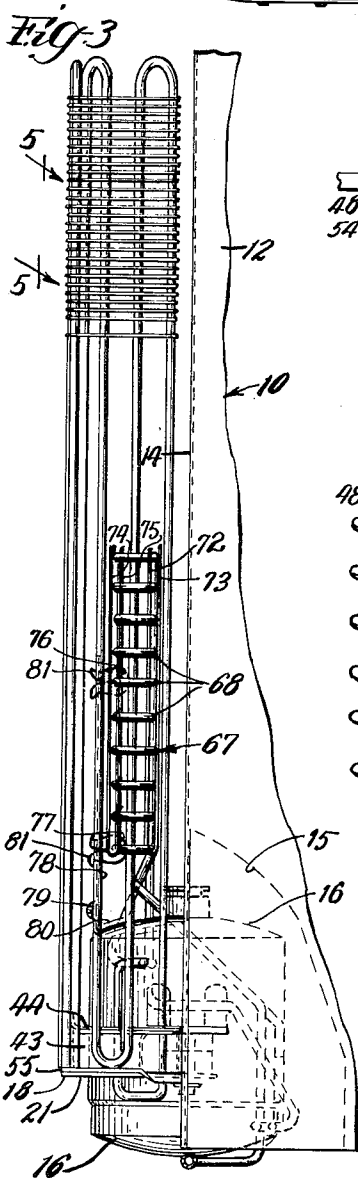
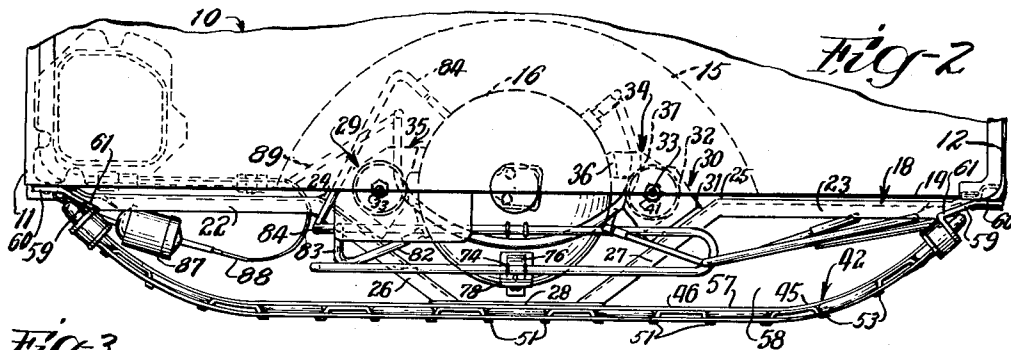
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WIRE CONDENSER IN REFRIGERATION SYSTEM

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,687,625

WIRE CONDENSER IN REFRIGERATION
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14 Claims. (Cl. 62—117.4)

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The present invention relates to wire condensers for domestic refrigerators, and is particularly concerned with condensers which utilize a multiplicity of attached wires carried by tubes for increasing the radiating area or surface of the assembly, and for other purposes hereinafter described.

One of the objects of the invention is the provision of an improved condenser for household refrigerators which utilizes a multiplicity of passes of hollow tubing, all of which are joined together by means of a multiplicity of transversely extending metal wires located on opposite sides of the tubing, and forming a flue for the guidance of convection air currents passing up the rear of the refrigerator inside the condenser.

Another object of the invention is the provision of an improved condenser and motor compressor assembly, by means of which the condenser and motor compressor form a unit, and the motor compressor is resiliently supported upon the condenser adjacent the lower end of the condenser in such manner as to operate with a minimum amount of noise.

Another object of the invention is the provision of an improved construction for condensers of the type utilized upon household refrigerators, which may be manufactured at a low cost, which is sturdy, and which has a maximum amount of radiating area while utilizing a minimum amount of metal in its fabrication.

Another object of the invention is the provision of an improved condenser of the class described, having an improved precooling section, which is advantageously located, and an improved mounting for the precooling section, the precooling section being used to cool the compressed refrigerant immediately upon its exit from the compressor, after which it is returned to the motor compressor housing which is of the sealed unit type.

Another object of the invention is the provision of an improved mode of support of a condenser upon the shell of a household refrigerator.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the two sheets of drawings accompanying the specification,

Fig. 1 is a rear elevational view partially broken away to show the structure of the precooling section and illustrating the wire condenser embodying my invention attached to the shell of a cabinet;

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Fig. 2 is a fragmentary top plan view;

Fig. 3 is a fragmentary side elevational view;

Fig. 4 is a fragmentary sectional view taken on the plane of the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary sectional view taken on the plane of the line 5—5 of Fig. 1, looking in the direction of the arrows.

Referring to Fig. 1, 10 indicates in its entirety the outer shell of a cabinet, having side walls 11, 12, and provided with attaching flanges 13 and with a rear panel 14 carried by said attaching flanges.

The rear panel 14 is provided with a round cavity formation 15, roughly approximately a quarter of a sphere for receiving the sealed motor compressor unit 16, which is located partly in the cavity 15 and partly outside the cavity but inside the condenser, as shown in Fig. 3.

The condenser assembly is supported from the attaching flanges 13 of the shell by a pair of screw bolts 17 which pass through a lower frame member 18 and clamp the frame member 18 to the shell.

Frame member 18 is preferably channeled in construction, being provided with a flat yoke or body 19, an upper horizontal flange 20, and a lower horizontal flange 21. The frame member 18 is provided with a pair of relatively straight portions 22, 23, Fig. 2, extending inwardly from both attaching flanges, and is bent diagonally outward at 24 and 25, having the outwardly extending diagonal portions 26, 27 joined by the outermost portion 28 in order to pass around the motor compressor with the channeled member 18.

The yoke of the diagonal portions 26, 27 in each case supports an angle bracket 29 and 30, having a vertical flange 31 and a horizontal flange 32 for carrying the motor compressor. The horizontal flange 32 has a central aperture for receiving the screw bolt 33 in each case, by means of which the motor compressor is hung.

The motor compressor also carries a pair of angle brackets 34, 35, each of which is provided with a pair of spaced partially cylindrical attachment flanges 36, which are welded or otherwise secured to the sealed unit housing 16.

Each of the motor compressor angle brackets 34, 35 has a horizontal supporting flange 37 which is partially circular and is located adjacent the horizontal flange 32 of the angle brackets 29 and 30.

The angle brackets 34, 35 are uppermost and they are also provided with apertures for the bolts 33, and support on their lower sides a shallow, cup-shaped washer 38 for seating one end of a coil spring 39. The other end of the coil spring

is seated in a substantially cylindrical shaped cup member 40, carried by the lower angle flanges 32 and open upwardly to receive the spring 39.

The spring 39 is under initial compression and can be so compressed that the washer 38 and cups 40 engage each other to hold the sealed unit 16 rigidly during shipment or transit.

During operation the nuts 41 should be retracted to the upper end of the bolt so that the sealed unit 16 is wholly supported by the springs 39 for resilient movement to absorb vibration and reduce noise.

The frame member 18 also supports a second curved frame member 42, Fig. 2, which may have a vertical body 43 and a horizontal flange 44, immediately under the horizontal flange 20 of the frame member 18. Both these frame members may be secured by the same bolts 17, but the frame member 42 extends diagonally outward from the rear panel 14 and is provided with an easy bend at 45 and a relatively straight portion 46, which is secured to the straight portion 28 of the frame member 18.

Thus the frame member 42 has an arch shape which determines the final curvature and shape of the wire condenser which it supports, and provides a flue for the convection air currents resulting from the heating action of the motor compressor and the condenser tubes.

The main condenser 47 consists of a multiplicity of vertical passes 48 of tubing arranged sinuously to extend from top to bottom of the condenser, and having easy bends 49 at the top and easy bends 50 at the bottom.

In the example shown there are 18 vertical passes of tubing, beginning and ending at the bottom for convenient attachment to the other parts of the system.

Referring to Fig. 4, the lower frame member 42 is provided with a multiplicity of tubing securing brackets 51, each of which has a body 52 that fits against the frame member 42, to which it may be secured by a plurality of spot welds, and each bracket has an outwardly curved clamping portion 53 at each end, forming a curved surface 54 for engaging the tubing 48.

Thus the brackets 51 clamp the tubing to the frame member 42. In addition, the tubing is supported by a horizontal flange 55, forming a part of the frame member 42, and projecting outwardly under the easy bends 50 to give them a vertical support.

The end vertical passes 48 are preferably secured to the frame member 18 by a separate bracket 92 having its apertured attaching flanges secured by the same bolts and nuts 17 that secure the frame to the shell.

Brackets 92 may be curved about a split rubber grommet which grips the tube 48 in each case.

The vertical passes 48 are secured in parallel relation to each other by means of a multiplicity of horizontal metal wires 56, spaced equally from each other and extending parallel to each other, as shown at the top of Fig. 1 in fragment, these wires extending from the farthest left tubing 48 to the farthest right tubing 48; and the wires being close to each other and covering the passes 48 from top to bottom excepting a short portion adjacent each easy bend 49 and 50.

The wires are on both sides of the tubing 48, as indicated by the numeral 56 for the front wires, and numeral 57 for the rear wires in Fig. 5. All wires are welded to the tubing, this being carried

on simultaneously at all points of weld above and below by means of suitable apparatus.

The wires 56 serve a purpose similar to fins except that they are capable of being assembled more economically; and they also form vertical flues between the passes 48, as well as a large flue 58, Fig. 2, between the rear panel of the cabinet and the inner wires 57.

At its upper end the condenser is supported by a pair of brackets 59, each of which has an attaching flange 60 secured by a pair of screw bolts which are threaded into the attaching flange 30 of the shell side walls.

Each bracket 59 has an inwardly extending flange 61 which is formed with a depending flange 62 that is curved into a part cylinder. The cylindrical flange 62 forms a hook which is upwardly open and which receives the cylindrical portion 63 of a resilient rubber grommet 64.

Grommet 64 has enlargements 65 at each end and a through bore 66 which receives two endmost easy bends 49. The grommets are split longitudinally to be opened and placed on the easy bends 49, and thus the upper end of the wire condenser is resiliently supported upon the cabinet.

The precool section of the condenser is indicated at 67, Fig. 1, and it preferably consists of a multiplicity of horizontal passes of tubing 68, these passes having horizontal easy bends at 69 at the right end, and vertical easy bends 70, 71 at the left end, so that the horizontal passes 68 are arranged in two vertical planes.

They are held in spaced relation by a few isolated vertically extending wires 72, 73 in one plane, and 74, 75 for the passes in the other plane, and these wires are preferably located midway between the ends of the precool condenser section 67, and spaced from each other sufficiently to receive two resilient rubber supporting members 76, 77, Fig. 1.

These rubber supporting members are seen also in Fig. 2 and in Fig. 3, and in the latter figure they are shown to be substantially U-shaped, embracing a horizontal pass of the precool section which is immediately adjacent a vertical supporting member 78, the lower end of which is secured by a screw bolt 79 to an angle bracket 80, fitted to and secured to the sealed unit 16.

In addition to the wires 72-75 on the precool tubing, which engage the rubber members 76, 77, the precool, like the main condenser, may have its full area covered on both sides with regularly spaced welded wires.

The ends of the U-shaped rubber members 76 pass through rectangular apertures in the vertical frame member 78, and are provided with enlarged heads 81 which pass these apertures and spring outward to retain the rubber members in the apertures. Thus the precool section 67 is resiliently supported upon the sealed compressor unit 16.

The connection of the condenser in the circuit is as follows:

An outlet tube 82 extends out from the compressor in the sealed unit housing 16, and has an upwardly extending portion 83, taking the compressed gases directly to the precool section 67, so that the heat is taken away from the compressor as soon as possible in the circuit.

From the precool 67 an outlet tube 84 extends downward into the top of the sealed unit housing 17, delivering the partially condensed vapor and liquid back to the sealed unit housing, where it descends between the windings and air

spaces, the oil returning to the sump in the bottom of the housing 16.

The outlet tubing from the top of the housing is indicated at 85, and this extends over to the first vertical pass 48 of the main condenser on the right side, and the refrigerant then passes through all of the passes 48, to the discharge end 86, which is connected to the drier 87 and thence to the capillary restrictor 88.

The capillary restrictor goes to the evaporator in heat exchange with the suction tube 89 returning from the evaporator, both these tubes being enclosed in an armor tube 90 extending from the rear foot pad 91 of the cabinet along one side of the cabinet, and around the front foot pad to be directed upwardly to the evaporator.

The suction tube 89 is curved over the top of the sealed unit 16, and its end extends into the inlet for the compressor.

The operation of the wire condenser is as follows:

The heat generated in the motor compressor by the compression of the expanded refrigerant gas causes the motor compressor to become hot, and this heat is radiated and conducted to the surrounding air which becomes heated and passes upwardly by convection currents in the flue 58, which is formed by the wire condenser.

The air passing upwardly aids in cooling the precooler section 67 of the condenser and cools the condenser tubes and wires which increase the radiating area of the condenser. Air also passes upwardly between each of the passes 48 in a space defined by the rear wires 56 and the front wires 57. Thus there is a small flue between each pair of vertical passes of tubing.

The improved mode of support of the motor compressor unit on the condenser permits these parts to be assembled and tested as a unit, and permits the sealed unit compressor to be fixedly mounted during shipment while it is resiliently supported when it is installed upon the cabinet.

The vibratory noise of the motor and compressor is isolated by springs and rubber grommets from the parts of the cabinet which might amplify such sound, thus causing the substantially noiseless operation of the assembly.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. A household refrigerator comprising a cabinet having an exterior metal shell provided with a rear panel, a lower condenser frame member having both of its ends secured to said shell adjacent the side walls of said cabinet, said frame member being bowed outwardly from said rear panel, a plurality of passes of tubing for receiving refrigerant carried by said frame member and forming the framework of a flue between said tubing and said rear panel, and a multiplicity of metal wires extending transversely to the passes of tubing and secured thereto in intimate heat exchange relation, and defining a cage like flue for the upward passage of air adjacent the rear panel, a second frame member carried by said shell and secured to it by the same securing means, the said second

frame member being provided with means for supporting a motor compressor unit on the latter frame member, and a motor compressor unit carried thereby, said means comprising supporting brackets carried by the second frame member and opposed brackets carried by the motor compressor unit, and resilient means between the brackets on the motor compressor unit and the brackets on the second frame member in each instance, said resilient means comprising a compression spring, and the said brackets being provided with cup-shaped members for seating said spring, and a through threaded member extending through the two brackets and springs in each instance, and having a nut placing an initial compression on the springs.

2. A household refrigerator comprising a cabinet having an exterior metal shell provided with a rear panel, a lower condenser frame member having both of its ends secured to said shell adjacent the side walls of said cabinet, said frame member being bowed outwardly from said rear panel, a plurality of passes of tubing for receiving refrigerant carried by said frame member and forming the framework of a flue between said tubing and said rear panel, and a multiplicity of metal wires extending transversely to the passes of tubing and secured thereto in intimate heat exchange relation, and defining a cage like flue for the upward passage of air adjacent the rear panel, a second frame member carried by said shell and secured to it by the same securing means, the said second frame member being provided with means for supporting a motor compressor unit on the latter frame member, and a motor compressor unit carried thereby, said means comprising supporting brackets carried by the second frame member and opposed brackets carried by the motor compressor unit, and resilient means between the brackets on the motor compressor unit and the brackets on the second frame member in each instance, said resilient means comprising a compression spring, and the said brackets being provided with cup-shaped members for seating said spring, and a through threaded member extending through the two brackets and springs in each instance, and having a nut placing an initial compression on the springs, one of said cup-shaped members being of sufficient depth to house the spring and engage the opposed bracket supported parts when the nut is driven to the point of rigidly clamping the bracket supported parts against each other for shipment.

3. A household refrigerator comprising a cabinet having an exterior metal shell provided with a rear panel, a lower condenser frame member having both of its ends secured to said shell adjacent the side walls of said cabinet, said frame member being bowed outwardly from said rear panel, a plurality of passes of tubing for receiving refrigerant carried by said frame member and forming the framework of a flue between said tubing and said rear panel, and a multiplicity of metal wires extending transversely to the passes of tubing and secured thereto in intimate heat exchange relation, and defining a cage like flue for the upward passage of air adjacent the rear panel, a second frame member carried by said cabinet and secured to it by the same securing means, the said second frame member extending along the rear panel from each side, and having outwardly extending portions extending again into engagement with the first frame member to which the second frame member is secured centrally of

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said rear panel, resilient supporting means carried by said second frame member at said outwardly extending portions, a motor compressor unit carried by said resilient supporting means and an upwardly extending frame member carried by said motor compressor unit, said latter frame member carrying a multiplicity of transversely extending passes of refrigerant tubing, serving as a precool section of the condenser and located above the motor compressor inside the flue provided by said condenser to be subjected to convection air currents passing upwardly from the motor compressor unit.

4. A household refrigerator comprising a cabinet having an exterior metal shell provided with a rear panel, a lower condenser frame member having both of its ends secured to said shell adjacent the side walls of said cabinet, said frame member being bowed outwardly from said rear panel, a plurality of passes of tubing for receiving refrigerant carried by said frame member and forming the framework of a flue between said tubing and said rear panel, and a multiplicity of metal wires extending transversely to the passes of tubing and secured thereto in intimate heat exchange relation, and defining a cage like flue for the upward passage of air adjacent the rear panel, a second frame member carried by said cabinet and secured to it by the same securing means, the said second frame member extending along the rear panel from each side, and having outwardly extending portions extending again into engagement with the first frame member to which the second frame member is secured centrally of said rear panel, resilient supporting means carried by said second frame member at said outwardly extending portions, a motor compressor unit carried by said resilient supporting means and an upwardly extending frame member carried by said motor compressor unit, said latter frame member carrying a multiplicity of transversely extending passes of refrigerant tubing, serving as a precool section of the condenser and located above the motor compressor inside the flue provided by said condenser to be subjected to convection air currents passing upwardly from the motor compressor unit, the said upwardly extending frame member being provided with a pair of vertically spaced apertures, and resilient U-shaped members of non-metallic composition extending around predetermined passes of said precool section, and having both legs confined in said apertures by enlargements at the ends of said legs.

5. A household refrigerator comprising a cabinet having an exterior metal shell provided with a rear panel, a lower condenser frame member having both of its ends secured to said shell adjacent the side walls of said cabinet, said frame member being bowed outwardly from said rear panel, a plurality of passes of tubing for receiving refrigerant carried by said frame member and forming the framework of a flue between said tubing and said rear panel, and a multiplicity of metal wires extending transversely to the passes of tubing and secured thereto in intimate heat exchange relation, and defining a cage like flue for the upward passage of air adjacent the rear panel, a second frame member carried by said cabinet and secured to it by the same securing means, the said second frame member extending along the rear panel from each side, and having outwardly extending portions extending again into engagement with the first frame member to which the second frame member is secured centrally of said

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rear panel, resilient supporting means carried by said second frame member at said outwardly extending portions, a motor compressor unit carried by said resilient supporting means and an upwardly extending frame member carried by said motor compressor unit, said latter frame member carrying a multiplicity of transversely extending passes of refrigerant tubing, serving as a precool section of the condenser and located above the motor compressor inside the flue provided by said condenser to be subjected to convection air currents passing upwardly from the motor compressor unit, the said upwardly extending frame member being provided with a pair of vertically spaced apertures, and resilient U-shaped members of non-metallic composition extending around predetermined passes of said precool section, and having both legs confined in said apertures by enlargements at the ends of said legs, the said precool section having its passes secured in definite spaced relation to each other by a plurality of vertically extending welded wires carried by said passes and located on opposite sides of said resilient U-shaped members.

6. A household refrigerator comprising a cabinet having an exterior metal shell provided with a rear panel, a lower condenser frame member having both of its ends secured to said shell adjacent the side walls of said cabinet, said frame member being bowed outwardly from said rear panel, a plurality of passes of tubing for receiving refrigerant carried by said frame member and forming the framework of a flue between said tubing and said rear panel, and a multiplicity of metal wires extending transversely to the passes of tubing and secured thereto in intimate heat exchange relation, and defining a cage like flue for the upward passage of air adjacent the rear panel, a second frame member carried by said cabinet and secured to it by the same securing means, the said second frame member extending along the rear panel from each side, and having outwardly extending portions extending again into engagement with the first frame member to which the second frame member is secured centrally of said rear panel, resilient supporting means carried by said second frame member at said outwardly extending portions, a motor compressor unit carried by said resilient supporting means and an upwardly extending frame member carried by said motor compressor unit, said latter frame member carrying a multiplicity of transversely extending passes of refrigerant tubing, serving as a precool section of the condenser and located above the motor compressor inside the flue provided by said condenser to be subjected to convection air currents passing upwardly from the motor compressor unit, the said upwardly extending frame member being provided with a pair of vertically spaced apertures, and resilient U-shaped members of non-metallic composition extending around predetermined passes of said precool section, and having both legs confined in said apertures by enlargements at the ends of said legs, the said precool section having its passes secured in definite spaced relation to each other by a plurality of vertically extending welded wires carried by said passes and located on opposite sides of said resilient U-shaped members, the said motor compressor unit having its compressor outlet directly connected with the inlet to said precool section passes by a conduit, and the outlet of said precool section passes extending into the motor compressor unit housing, and conduit means extending from

the upper part of said motor compressor housing to the inlet for the passes of tubing of said condenser.

7. In a household refrigerator, the combination of an insulated cabinet having an outer metallic shell provided with a back panel, a condenser comprising a plurality of vertical passes of tubing joined by U-bends at the top and at the bottom, upper brackets comprising attaching flanges secured to said shell and tubular parts carried by said brackets and containing resilient nonmetallic grommets, said grommets surrounding the endmost U-bends of said condenser to support the top of the condenser on said cabinet, heat dissipating members welded to said tubing and extending from side to side of said condenser across said passes, said members being bowed outwardly from said cabinet and said condenser forming a chimney behind said back panel.

8. In a household refrigerator, the combination of an insulated cabinet having an outer metallic shell provided with a back panel, a condenser comprising a plurality of vertical passes of tubing joined by U-bends at the top and at the bottom, upper brackets comprising attaching flanges secured to said shell and tubular parts carried by said brackets and containing resilient non-metallic grommets, said grommets surrounding the endmost U-bends of said condenser to support the top of the condenser on said cabinet, heat dissipating members welded to said tubing and extending from side to side of said condenser across said passes, said members being bowed outwardly from said cabinet and said condenser forming a chimney behind said back panel, said shell supporting similar brackets adjacent the lower end of said condenser and having grommets carried by said brackets and surrounding the outermost vertical passes of said tubing.

9. In a household refrigerator, the combination of an insulated cabinet having an outer metallic shell provided with a back panel, a condenser comprising a plurality of vertical passes of tubing joined by U-bends at the top and at the bottom, upper brackets comprising attaching flanges secured to said shell and tubular parts carried by said brackets and containing resilient non-metallic grommets, said grommets surrounding the endmost U-bends of said condenser to support the top of the condenser on said cabinet, heat dissipating members welded to said tubing and extending from side to side of said condenser across said passes, said members being bowed outwardly from said cabinet and said condenser forming a chimney behind said back panel, and a lower bowed frame member secured at its ends to said shell and extending from side to side of said cabinet below said condenser, and having an outwardly turned supporting flange under the lower U-bends of said tubing.

10. In a household refrigerator, the combination of an insulated cabinet having an outer metallic shell provided with a back panel, a condenser comprising a plurality of vertical passes of tubing joined by U-bends at the top and at the bottom, upper brackets comprising attaching flanges secured to said shell and tubular parts carried by said brackets and containing resilient non-metallic grommets, said grommets surrounding the endmost U-bends of said condenser to support the top of the condenser on said cabinet, heat dissipating members welded to said tubing and extending from side to side of said condenser across said passes, said members being bowed

outwardly from said cabinet and said condenser forming a chimney behind said back panel, and a lower bowed frame member secured at its ends to said shell and extending from side to side of said cabinet below said condenser, and having an outwardly turned supporting flange under the lower U-bends of said tubing, the said bowed frame member having retaining clips located between pairs of vertical passes of tubing and provided with oppositely extending end portions bent to extend out and around the opposite side of said vertical passes to secure the condenser to said frame member.

11. In a household refrigerator, the combination of an insulated cabinet having an outer metallic shell provided with a back panel, a lower frame member extending from side to side and spaced from said back panel, a motor compressor carried by said frame member, a vertical bar carried by said motor compressor and having a plurality of spaced apertures, a condenser comprising a plurality of horizontal passes of tubing joined by U-bends at their ends, vertical spacers welded to each pass of tubing to hold the passes in parallel spaced relation to each other, and resilient non-metallic split blocks surrounding certain passes of said tubing and having the ends of the split blocks compressed in said apertures to support the condenser on said bar.

12. In a household refrigerator, the combination of an insulated cabinet having an outer metallic shell provided with a back panel having a pressed cavity at its lower end for receiving a motor compressor, a lower channeled and bowed frame member having its ends secured to said cabinet with the bowed portion opposite said cavity, said frame member carrying inwardly projecting motor supporting brackets on opposite sides of said cavity, a motor compressor having oppositely extending brackets with flanges above said supporting brackets, a bolt passing through each pair of brackets and a coil spring between each pair of brackets, each bolt having a cup-shaped member surrounding each spring and extending toward the other bracket and having a nut clamping the cup member against the opposite bracket rigidly for shipment.

13. In a household refrigerator, the combination of an insulated cabinet having a back panel, an angular back frame member extending from one edge of the back panel to the other edge of the back panel and outwardly bowed from said back panel, said frame member being secured at both of its ends to the back panel and having a plurality of sinuous vertical passes of condenser tubing extending parallel to each other with U-bends above and below, the lower U-bends being secured to said frame member, a multiplicity of round wire heat-dissipating members arranged in two layers, one layer entirely on the outside of said tubing and welded thereto and the other layer entirely on the inside of said tubing and welded thereto, the said wires being closely spaced from each other and parallel to each other in heat-conducting engagement with the tubing for dissipating the heat of said condenser, said back panel being provided with a pair of metal brackets at the top of said condenser, each bracket being formed with a horizontally extending, partially cylindrical flange embracing a rubber grommet which extends about the U-shaped bend of the tubing at the outermost portions of the tubing, the said tubing including a pair of straight, downward passes, one at each lateral edge of the condenser and the said back panel supporting a pair

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of metal brackets on said angular frame member, said latter metal brackets having partially cylindrical flanges each embracing a rubber grommet surrounding said downward pass of tubing.

14. In a household refrigerator, the combination of an outer shell provided with a back panel, a transversely extending, channeled frame member carried by said shell and extending from side to side of the back panel and having a central outwardly bulging portion, said back panel having a cavity for receiving part of a motor compressor, a pair of angle brackets carried by said channel, one at each side of said bulging portion and having inwardly extending flanges provided with apertures, screw bolts in said apertures and provided with helical compression springs, a motor compressor located in said cavity and inside said bulging portion of said channeled member and provided with a pair of lateral angle brackets having apertured flanges located to receive said screw bolts, metal cups surrounding said helical springs and adapted to be engaged by the flanges on said channeled member and the flanges on said

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motor compressor when the helical sprign is compressed by nuts on said screw bolts, said nuts being retractable for resilient mounting of said motor compressor, a vertical column fixedly secured to said motor compressor and having a pair of apertures, a multiplicity of sinuous horizontal passes of tubing forming a preliminary condenser and secured together in parallel relation by a pair of vertical extending wires welded to said passes, and U-shaped, resilient non-metallic members extending about two of said passes and having their legs secured in the apertures of said column for mounting said preliminary condenser on said column.

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