

March 17, 1936.

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2,034,138

REFRIGERATING APPARATUS

Original Filed July 3, 1931 2 Sheets-Sheet 1

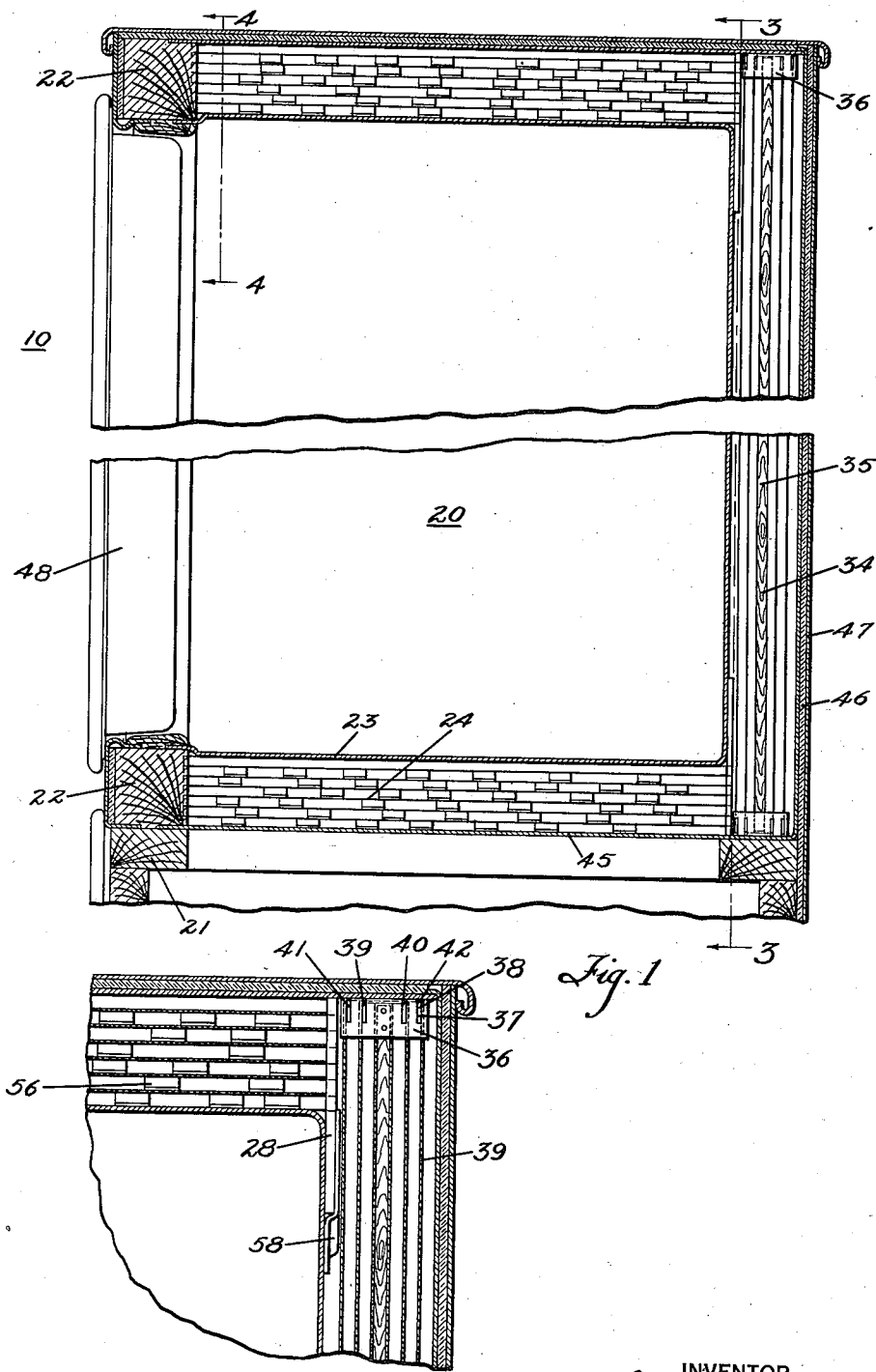


Fig. 2

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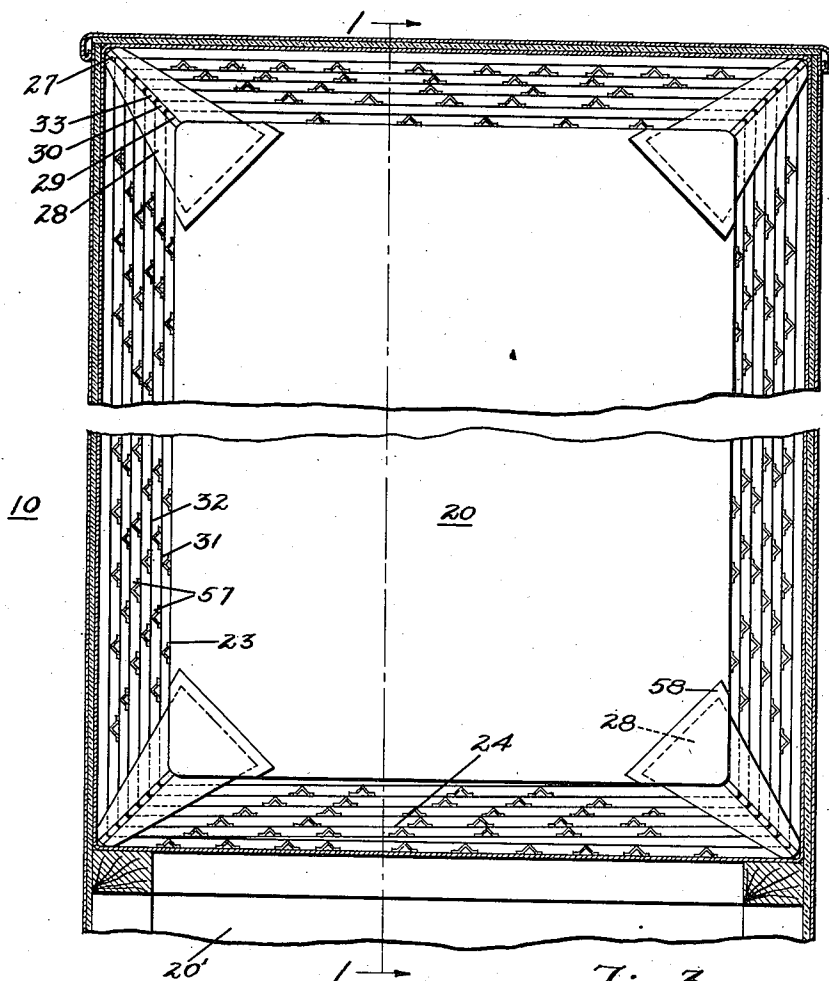


Fig. 3

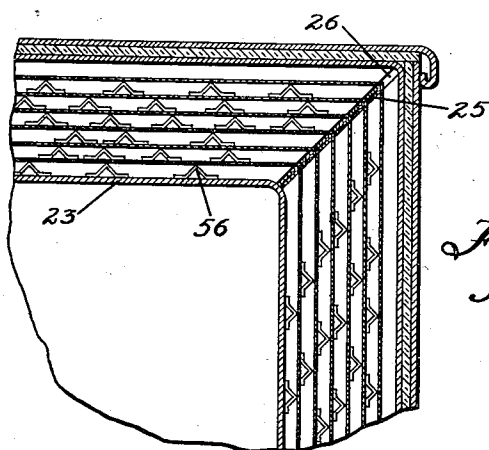


Fig. 4

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REFRIGERATING APPARATUS

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mesne assignments, to General Motors Corpo-
ration, a corporation of Delaware

Application July 3, 1931, Serial No. 548,590
Renewed December 30, 1932

15 Claims. (Cl. 220-9)

This invention relates to refrigerating apparatus and more particularly to insulated cabinets and to methods of constructing such insulated cabinets.

5 The objects of my invention include: an improved insulated cabinet construction wherein the walls are formed of a plurality of air spaces, lined by sheets of bright metallic foil; an improved construction wherein spacers are provided between such set of adjacent sheets of foil and
10 wherein means are provided for supporting the spacers in position; an improved construction of spacer elements for the sheets of foil whereby the sheets may be formed by winding a continuous strip of foil continuously around four sides of the cabinet; and an improved method of cabinet construction wherein the lining is bounded by a plurality of air spaces by winding a continuous strip of bright metallic foil around the
20 lining.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a vertical section through a portion of a refrigerator cabinet along the lines 1-1 of Fig. 3;

30 Fig. 2 is an enlarged section of an upper corner of Fig. 1;

Fig. 3 is a section along the line 3-3 of Fig. 1, and

35 Fig. 4 is a section along the line 4-4 of Fig. 1.

My invention is herein applied to refrigerator cabinet construction for illustrative purposes. In Fig. 1, for example, the cabinet generally designated at 10 includes a food compartment 20 and a machinery compartment 20'. The lower supporting frame construction 21 supports the door sill frame 22. The inner liner 23 of the food storage compartment 20 is made in one piece and is secured at its front edges to the door sill frame 22 in any suitable manner. Surrounding the inner liner 23 on its top, bottom, rear and side panels is insulation comprising a plurality of air spaces 57 lined by sheets of bright metallic foil. In order to provide air spaces between the sheets of bright metallic foil 24 surrounding the top, bottom and sides of the inner lining 20, a plurality of spacing members 25, preferably of wood, are provided at the intersections of each side of the inner lining. These spacing members are supported by slots 26 in the corners of the door
55 sill frame 22 and by slots 27 in the ears 28 which

are held by the sheet metal brackets 58 fastened to the outside of the rear wall of the inner liner 23 at the corners. These slots extend outwardly from the intersection of the inner liner at an angle of 45°. The ears 28 are formed of a material having a low conducting value such as wood or cardboard. The ends of the spacing members 25 are held within the slots 26 and 27 to provide a lateral support for the spacing members so as to hold them in superimposed relation. The
5 sheets 24 of bright metallic foil are positioned between the adjacent spacing members and extend between the various groups of spacing members at the different intersections of the walls of the inner lining 23.
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The sheets of foil are preferably placed in spaced relation about the inner lining 23 by a winding method. One end of the foil is preferably attached to the inner lining and the foil wound about over each of the innermost spacing members 29, then the second set of spacing members 30 are placed in the slots on top of the first layer of winding 31, and then the second turn of winding is wound over the second set of spacing members to wind the second turn 32 of foil, and after this the third set of spacing members 33 are placed in their respective slots on top of the second turn 32 of foil and the winding continued in this fashion until the desired number of layers are wound. If desired, the sheets of foil may be
30 bonded to the spacing members by a suitable glue or cement.

In order to provide insulation for the back of the food storage compartment 20, a wooden frame 34 is provided for holding a plurality of sheets of
35 bright metallic foil spaced by air. The frame 34 comprises a pair of widely spaced uprights 35 positioned against the outer sides of the cabinet and connected by cross strips at their upper and lower ends to provide a rectangular frame. At the sides of the uprights adjacent their upper and lower corners are provided wooden or cardboard plates 36 (see Fig. 2) having a plurality of slots 37 therein. Within these slots 37 are held the
40 spacing members 38. These spacing members 38 extend across the top and bottom frame 34 and have their ends supported in the slots 37 within the plates 36. Sheets of foil 39 are stretched between corresponding upper and lower spacing members so that a plurality of sheets of foil
45 spaced by air spaces are provided.

The frame 34 together with the foil thereon is preferably constructed before attaching to the cabinet by a winding method. In this method one end of the foil is first attached to one of the
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cross pieces connecting the uprights 35 and the foil is wound first about the rectangular frame formed by the uprights 35 and the connecting cross pieces and then the inner set of spacing members 39 and 40 are inserted in their respective slots and the foil is wound about these inner sets of spacing members and after completing the turn about the inner spacing members, the outer set of spacing members 41 and 42 are put in place and the foil is wound about the outer sheets of spacing members. This construction provides a plurality of sheets of bright metallic foil spaced by air. After the loose end of the wound foil is fastened, the frame 34 together with the foil wound thereon is placed in its proper position adjacent the back of the inner lining 23.

In order to maintain the proper thickness of air spaces between the various strips of foil, corrugated cardboard spacing members 56 may be scattered between the various layers of foil. This prevents the rattling or the so-called metal cry of the foil. If desired, the spacing members 56 may be glued to the foil before or during winding.

An outer liner 45 surrounds the insulation adjacent the inner liner and has its front end fastened to the door sill frame 22. This outer liner 45 is put in place after the insulation has been wound about the inner liner and the frame 34 has been put in its place. Chipboard 46 surrounds the exposed portions of the outer liner 45 and a sheet metal covering 47, coated with a desirable finish such as porcelain, is provided on top of the chipboard 46. The door sill frame 22 is similarly covered to provide a similar type of finish and is similarly provided with chipboard and a sheet metal covering coated with porcelain. The door 48 is provided with inner and outer sheet metal walls and is preferably insulated by spaced sheets of bright metallic foil upon a frame similar to the frame 35. By this type of construction the cabinet may be insulated by an easy and rapid method.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A cabinet including spaced inner and outer walls, an insulating structure between said walls, said insulating structure comprising a plurality of spaced apart metal surfaced heat reflecting sheets, a pair of spacers between each set of adjacent sheets and means carried by said inner wall for laterally supporting one spacer of each pair.

2. A cabinet including spaced inner and outer walls, an insulating structure between said walls, said structure including a plurality of spaced sheets of bright metallic foil, spacers between adjacent sheets, a bracket secured to said inner wall, and means carried by said bracket for supporting said spacers in position.

3. A cabinet including spaced inner and outer walls, an insulating structure between said walls, said structure including a continuous layer of bright metallic foil wound around said inner wall to form a plurality of spaced sheets, spacers between adjacent sheets, and a single means carried by said inner wall for supporting said spacers in position.

4. A cabinet including spaced inner and outer walls, an insulating structure between said walls, said structure including a continuous strip of bright metallic foil wound about said inner wall to form a plurality of spaced sheets, spacers be-

tween adjacent sheets, a bracket secured to said inner wall, and means carried by said bracket for supporting said spacers in position.

5. An insulated storage cabinet having a plurality of intersecting inner walls, a plurality of superimposed spacing members at said intersections, guide means supported by said inner walls for laterally supporting said spacing members in superimposed relation, and a sheet of bright metallic foil stretched between sets of spacing members at said intersections, said sheet being positioned between adjacent spacing members.

6. An insulated cabinet including a plurality of intersecting inner walls, means having a plurality of slots at the intersections of the walls, said slots extending outwardly from said intersections, a plurality of spacing members in said slots, and a continuous strip of bright metallic foil wound spirally around said inner walls between each pair of said spacing members for providing a plurality of spaced portions of said strip.

7. An insulated cabinet having a plurality of intersecting inner walls, a plurality of spaced sheets of bright metallic foil surrounding said inner walls, means for spacing said sheets adjacent the intersections of said inner walls, and a plurality of individual spacing means scattered between said sheets for spacing said sheets and for preventing metal cry.

8. An insulating structure including a plurality of sheets of foil, spacers between each set of adjacent sheets, said spacers extending across the sheets from one edge to the other, and means engaging only the exposed end portions of the spacers for holding the spacers in position, said sheets extending between and being held between the spacers.

9. An insulating structure including a plurality of metal surfaced heat reflecting sheets extending in planes parallel to one another, a plurality of spacers located between two sheet portions and extending across the sheets from one edge of the sheets to the other, said spacers being positioned in alignment one on top of another, said sheets extending between the spacers and means engaging only the end portions of the spacers for laterally supporting the spacers to hold them in alignment.

10. An insulating structure including a plurality of sheets of foil extending in planes parallel to one another, a plurality of spacers extending between the sheets from one edge of the sheets to the other, said spacers having end portions extending beyond the edges of the sheets, and means engaging the portions of the spacers extending beyond the edges of the sheets to hold the spacers in position.

11. An insulating structure including a plurality of sheets of foil extending in planes parallel to one another, a plurality of spacers extending between the sheets from one edge of the sheets to the other, said spacers having end portions extending beyond the edges of the sheets, and means engaging the portions of the spacers extending beyond the edges of the sheets to hold the spacers in position and a plurality of small individual spacing means scattered between the sheets of foil for preventing metallic cry and for supporting sagging portions of the sheets.

12. An insulating structure including a plurality of sets of spacers, each set being located a distance from the other, each set being composed of a plurality of individual spacers one on

top of the other, means for laterally supporting the spacers to hold the spacers in alignment one on top of the other, and a metal surfaced heat reflecting sheet extending around and between the spacers to provide portions of the sheets spaced by air spaces, said spacers extending across the sheet from one edge to another.

13. An insulating structure including a plurality of sets of spacers, each set being located a distance from the other, each set being composed of a plurality of individual spacers one on top of the other, means for laterally supporting the spacers to hold the spacers in alignment one on top of the other, and a sheet extending around and between the spacers to provide portions of the sheets spaced by air spaces, said spacers extending across the sheet from one edge to another.

14. An insulating structure including a plurality of sets of spacers, each set being located

a distance from the other, each set being composed of a plurality of individual spacers one on top of the other, means engaging only the end portions of the spacers to hold the spacers in alignment one on top of the other, and a sheet wound around and between the spacers to provide sheets spaced by air spaces, said spacers extending across the sheet from one edge to another.

15. An insulating structure including a plurality of sheets, spacers between each set of adjacent sheets, supporting means contacting with opposite sides of the spacers for holding said spacers in alignment one on top of the other, said sheets extending between and being held between the spacers to provide narrow air spaces between the sheets, said spacers extending across the sheets from one edge portion to another.

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