May 3, 1932. G. W. BUNGAY 1,856,536

REFRIGERATING SYSTEM

Filed Dec. 10, 1929 2 Sheets-Sheet 1

Fig. 1.

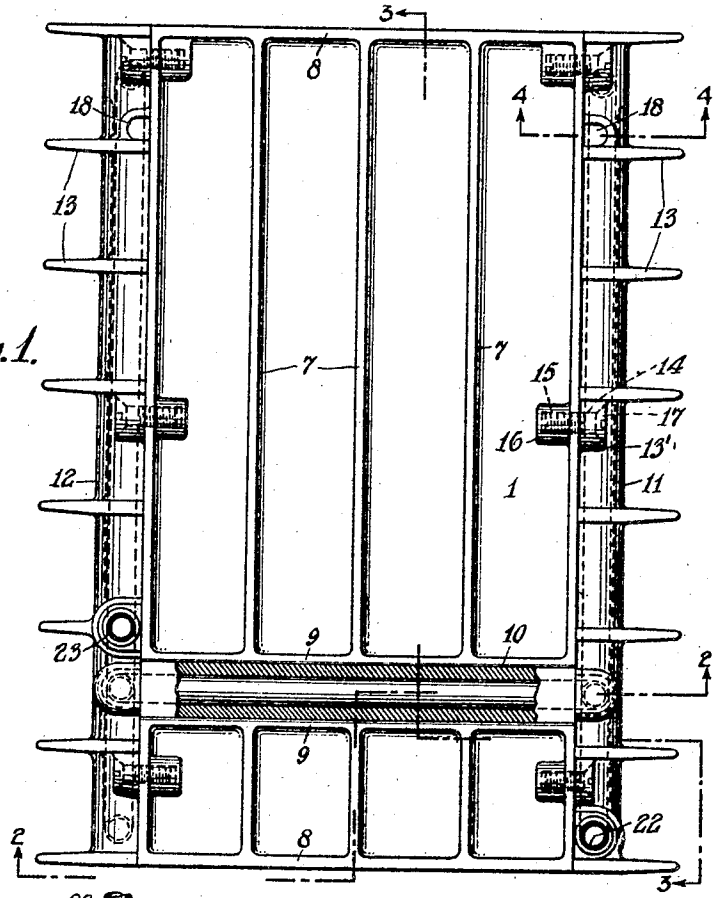
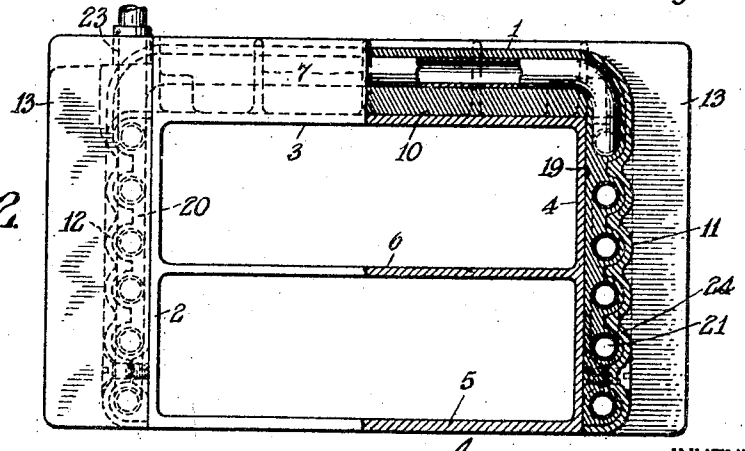


Fig. 2.



INVENTOR
George W. Bungay
BY
Wm. S. Pritchard
ATTORNEY

May 3, 1932. G. W. BUNGAY 1,856,536

REFRIGERATING SYSTEM

Filed Dec. 10, 1929 2 Sheets-Sheet 2

Fig. 3.

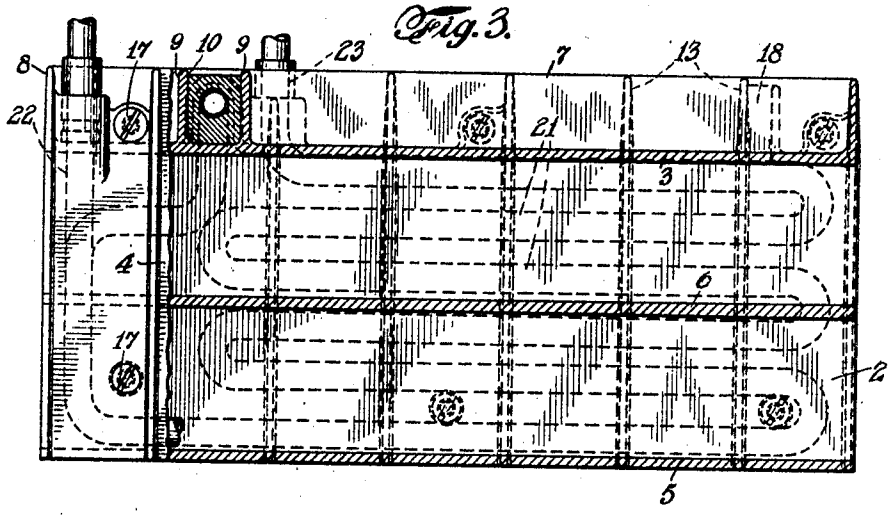


Fig. 4.

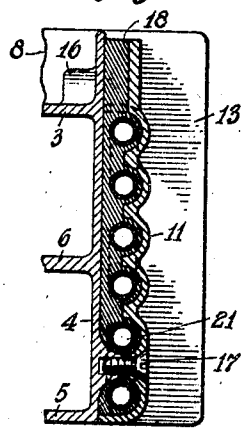
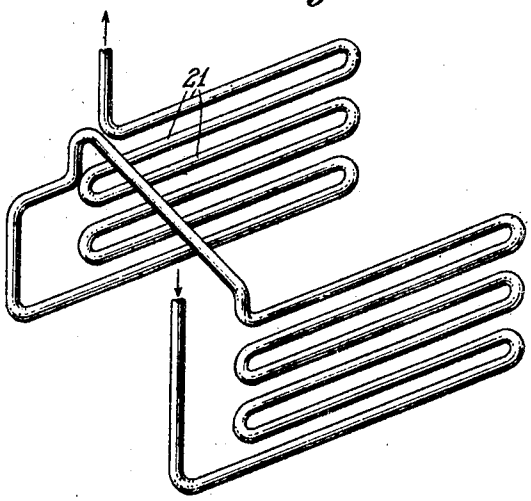


Fig. 5.



George W. Bungay INVENTOR

BY: Wm. S. Sutherland

ATTORNEY

Patented May 3, 1932 1,856,536

UNITED STATES PATENT OFFICE

GEORGE W. BUNGAY, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO ALUMINUM COMPANY OF AMERICA, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

REFRIGERATING SYSTEM

Application filed December 10, 1929. Serial No. 412,953.

This invention relates to the art of refrigeration, and more particularly to a new and improved refrigerating expander unit and the mode of constructing the same.

The invention provides a simple and inexpensive process, whereby the expansion coils of a refrigerating expanding unit are embedded in a metallic wall of said unit, thereby interposing an effective conducting medium between the coils and the cooling chamber thereof.

According to the present invention, the elements of the units are assembled, so as to define a hollow wall, with the expansion coils positioned in the coil chamber constituted by said wall. This organization is then preheated, and a suitable molten metal poured into said coil chamber so as to envelope said coils and fill the intervening spaces with said metal. In this manner a unit is constructed which is simple and efficient as well as inexpensive.

Various other features and advantages of the invention will be apparent from the following particular description and from an inspection of the accompanying drawings.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in conection with the accompanying drawings forming a part thereof, in which:

Figure 1 is a top plan view of the expander unit;

Figure 2 is a section taken on line 2—2 of Figure 1;

Figure 3 is a section taken on line 3—3 of Figure 1;

Figure 4 is a section taken on line 4—4 of Figure 1; and

Figure 5 is a perspective showing the arrangement of the coils.

Like reference characters denote like parts in the several figures of the drawings.

In the following description and in the claims parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

The following drawings exemplify the adaptation of the present invention to a refrigerating expander unit of the type similar to that used in ordinary household refrigerators. This embodment comprises generally a main casing 1 bounded by four walls 2, 3, 4 and 5, and having a shelf 6 integral therewith. The bottom wall 5 and the shelf 6 are adapted to hold trays for making ice, frozen desserts, and the like. The top wall 3 is provided with a plurality of longitudinal radiating ribs 7 and a plurality of transverse radiating ribs 8 and 9. The radiating ribs 9 are spaced so as to conjointly define with the wall 3 a trough 10, which constitutes part of the coil chamber hereinafter described. Secured to the main casing 1 are two side shell members 11 and 12 which are provided with a plurality of transverse radiating ribs 13 and which have vent holes 18 for the purpose hereinafter referred to. These shell members 11 and 12 are provided with bosses 13′ having tapped bores 14 therethrough. These tapped bores 14 register with the tapped bores 15 in the bosses 16 which are integral with the main casing 1. The shells 11 and 12 are secured to the casing 1 by means of screws 17 passing through the corresponding bosses.

The side shells 11 and 12 are so constructed and associated with the casing 1 as to conjointly define hollow walls. These hollow walls constitute chambers 19 and 20 for the reception of the expanding coils 21 through which a suitable refrigerant is conducted. These coils lead into the chamber 19 through an opening 22 in the shell 11 and are serpentined in said chamber. The coils continue along the trough 10 into the chamber 20 where they are sinuously arranged therein and passed out through an opening 23 in the shell 12 (see Figures 1 and 5).

The spacing between the coils and the outer walls of the coil chamber is filled with a suitable metal such as lead, tin, zinc and the like. The shells 11 and 12 are convoluted at 24 to conform with the contour of the coils 21 (as shown in Figure 2) so as to effect a

minimum amount of spacing between these coils and the shells 11 and 12. This particular construction has the advantage of providing a greater amount of radiating surface as well as minimizing the amount of metallic filling in the coil chambers 19 and 20.

In assembling the elements of the unit the coils 21 are placed around the main casing 1 and the side shells 11 and 12 are screwed in place. The organization is then preheated and the molten metal, having a melting point which is preferably lower than the melting point of the metal that it comes in contact with, is poured into the coil chambers 19 and 20 through the trough 10. This molten metal may be lead, zinc, tin, and the like, although lead is preferred. The air is permitted to escape through the vents 18 while the pouring process is progressing. These vents also act as overflow openings for the molten lead.

It should be noted that through the process as described a novel means has been created for interposing a metallic conducting agent between the expanding coils and the cooling chamber. It should also be observed that by embedding the expanding coils in a metallic filling instead of a solid metallic wall, the costly process of sand-casting is obviated.

The present invention has been concretely exemplified in the form of a refrigerating expander unit, but it is obvious that it can be adapted to any device whose function resides in conveying heat from one medium to another.

Although certain novel features of the invention have been shown and described and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes in the several steps of the process and in its operation and in the form and details of the apparatus illustrated may be made by those skilled in the art without departing from the spirit of the invention.

I claim:

1. An expander unit of the class described comprising a main casing having top, bottom and side walls which define a cooling chamber, radiating ribs associated with said casing, a pair of said ribs conjointly defining with said top wall a trough, shells associated with said main casing and forming hollow walls therewith, an expansion coil serpentined in said hollow wall and extending along said trough, and a filling of metal occupying the intervening spaces in said wall and trough.

2. An expander unit of the class described comprising a main casing having top, bottom and side walls which define a cooling chamber, radiating ribs associated with said casing, a pair of said ribs conjointly defining with said top wall a trough, shells associated with said main casing and forming hollow walls therewith, an expansion coil serpentined in said hollow wall and extending along said trough, and a filling of lead occupying the intervening spaces in said wall and trough.

3. A refrigerator expander unit of the class described comprising a casing having a hollow wall with one side thereof corrugated, a filling of metal in said wall, and an expansion coil embedded in said metal filling.

4. A refrigerator expander unit of the class described comprising a casing having a hollow wall, a filling of metal in said wall, an expansion coil embedded in said metal filling, one side of said wall being corrugated to substantially conform with the contour of said coil.

5. A refrigerator expander unit of the class described comprising a casing having a hollow wall, a filling of lead in said wall, and an expansion coil embedded in said lead filling, one side of said wall being corrugated to substantially conform with the contour of said coil.

In testimony whereof, I have affixed my signature to this specification.

GEORGE WALDEMAR BUNGAY.