Oct. 7, 1930. L. G. COPEMAN 1,777,787

REFRIGERATOR

Filed Jan. 5, 1928

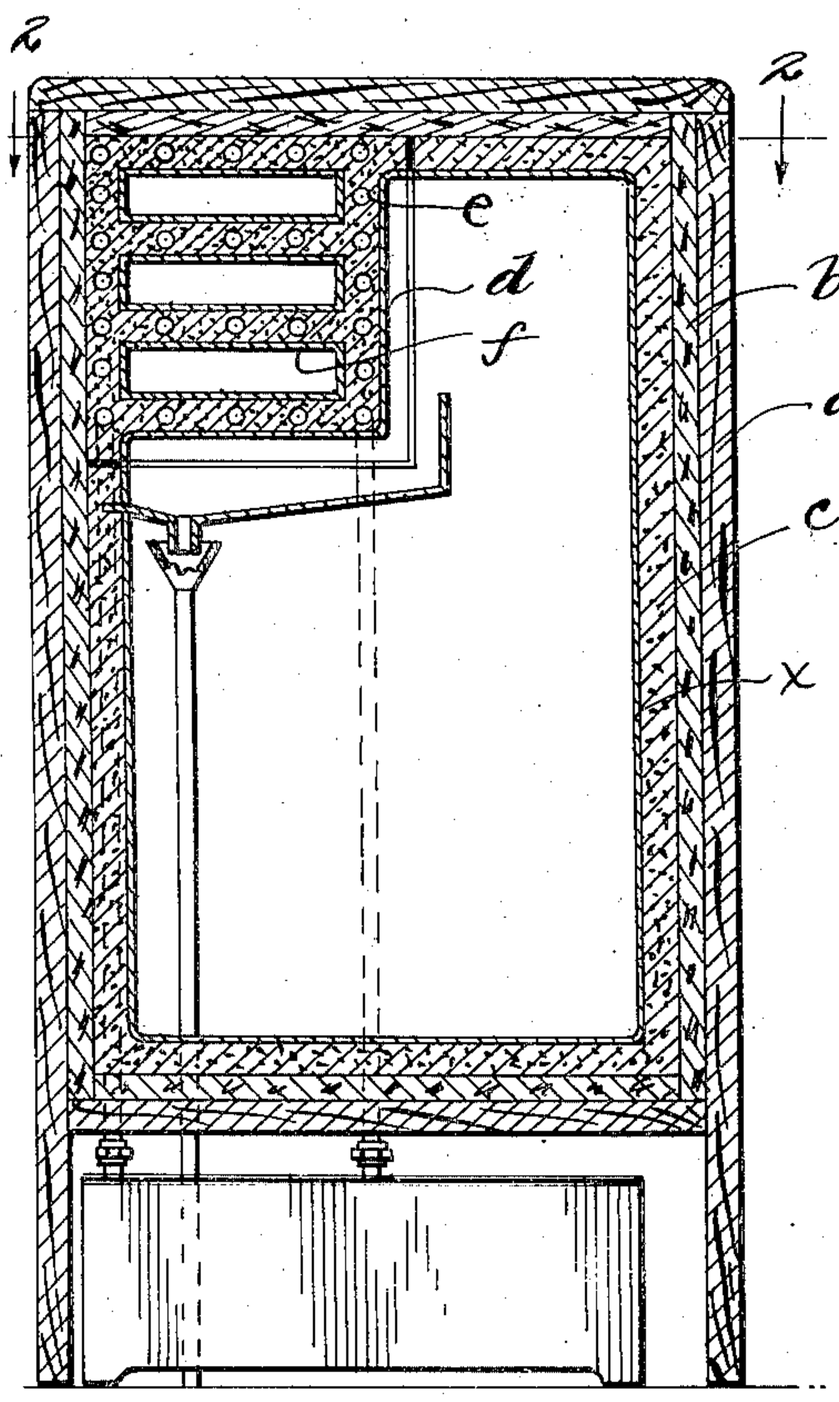

Fig. 1

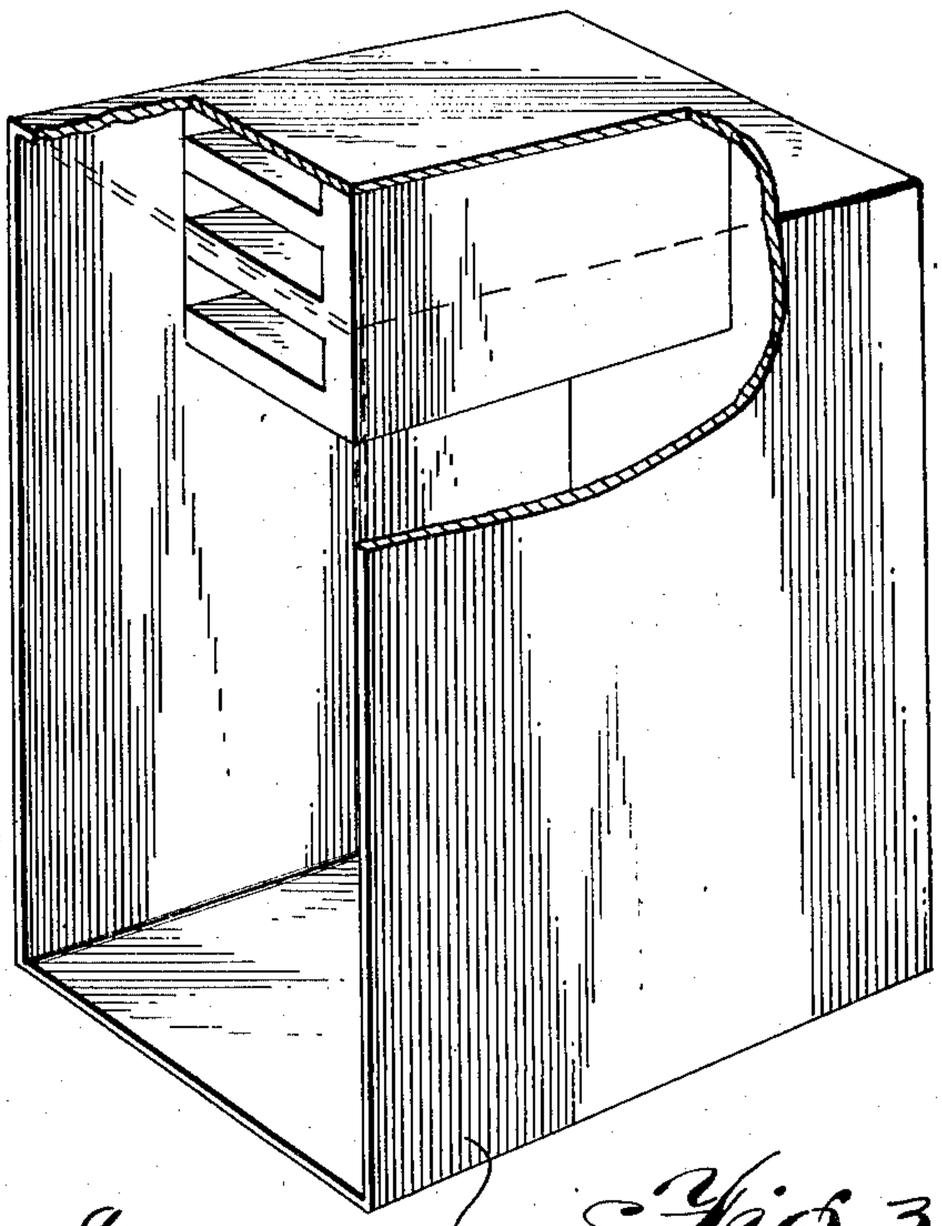

Fig. 3

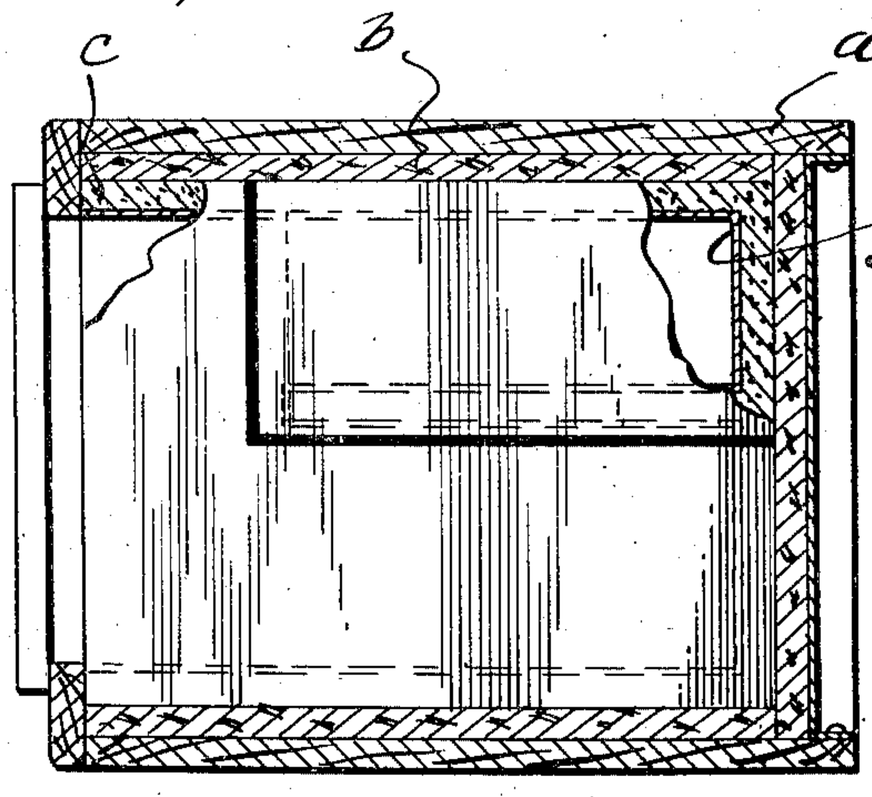

Fig. 2

INVENTOR.
Lloyd G. Copeman
BY
Stuart & Barnes
ATTORNEY.

Patented Oct. 7, 1930

1,777,787

UNITED STATES PATENT OFFICE

LLOYD G. COPEMAN, OF FLINT, MICHIGAN, ASSIGNOR TO COPEMAN LABORATORIES COMPANY, OF FLINT, MICHIGAN, A CORPORATION OF MICHIGAN

REFRIGERATOR

Application filed January 5, 1928. Serial No. 244,579.

This invention relates to refrigerators, and has for its object a refrigerator which employs a stone casting not only as a lowside for the mechanical refrigerating unit but also employs a stone encasing shell which serves as a hold-over for absorbing heat.

In some of my prior applications, as, for instance, application Serial No. 235,633, filed November 25, 1927, I have described and claimed a refrigerator in which the inside lining for a refrigerator is coupled up with the lowside of a mechanical refrigerating unit for the purpose of abstracting the heat more uniformly from all regions of the refrigerator.

The object of the present invention is to provide a stone refrigerator unit which has the same function of more evenly abstracting the heat from all regions of the refrigerator, and which at the same time is lined with metal so as to form a protecting coat for the stone, and also forming a core for casting the stone in the manufacture of the refrigerator. This will be more fully explained hereinafter.

In the drawings:

Fig. 1 is a vertical section through the refrigerator.

Fig. 2 is a cross section of the same.

Fig. 3 is a perspective showing the inner shell of metal.

Referring to the drawings, the outer shell of the box may be made of wood or any other suitable material and this is designated *a*. Preferably within this is laid on a well known insulating material, such as cork board *b*, which may be nailed or fitted into place in the outer shell.

A sheet metal lining, preferably a unit shell *c* of metal that can be formed by welding, or a heavy press operation is provided. This shell is preferably finished on the inside by glass enameling or covering *x* with any suitable pyroxylin lacquer or other porcelain finish. This shell has a lowside box-like shell portion designated *d*. This expansion unit or lowside may be a boiling chamber, but I have shown it here as a stone casting into which are cast the pipes *e* of the expansion coil. The box-like lowside shell is provided with welded-in sharp freezing chamber shells *f* which also act as cores in the stone casting operation.

One of the great advantages of this arrangement is that it provides a sheet metal lining which is absolutely impervious to water and at the same time the lining itself forms the inside core for casting the stone. The shell is placed within the cabinet formed by the outer shell and the insulation. It can be properly spaced from the insulation, and then the plastic stone poured between the insulation and the shell. This stone composition is preferably an oxychloride cement, but might be any other suitable plastic material. The plastic stone unites with the insulation and oxy-chloride cement, and also with the metal. An oxy-chloride composition suitable for this purpose is described in my prior Patents 1,644,987 and 1,644,988, dated October 11, 1927. However, this stone composition may be varied within wide limits without departing from my invention. A great advantage in employing this lining is that it takes the place of an expensive core. Furthermore, it prevents moisture from the chamber reaching the stone, and also protects the stone by affording a strong, tenacious lining therefor.

I find that with the box constructed as described, that it is possible to ship out the refrigerators very shortly after they have been poured. In fact, these oxy-chloride cement mixes such as I have described will be stiff enough in one or two hours after they have been poured so that the box can be shipped, if this is desirable. The lining will hold the mix so that the same can harden and set during the transportation. In the old practice, a large quantity of expensive cores are required in order to get any considerable production, and a large amount of plant space will be necessary in order to allow the stone to completely set before the cores are removed. In my new refrigerator the linings of the food chamber and the linings of the sharp freezing chambers form the cores, and become a permanent part of the refrigerator.

Also, all the advantages of having a cast stone connection directly with the lowside in

forming the so-called hold-over is afforded. By "hold-over" I mean a very large solid unit is provided from which heat is abstracted by the evaporation in the lowside. This will keep in this cold condition even when the food chamber tends to warm up. This will permit the heat appearing in the food chamber to be transmitted into the stone and consequently will very materially cut down the number of times that the refrigerating apparatus will have to be operated in order to maintain a given temperature in the food chamber. With this large stone surface to be kept cold by abstraction of the heat, it will be obvious that a great deal of heat will be exchanged between the food chamber and this stone before the unit is called upon again to operate. This saves wear and tear on the unit, as considerable strain is put upon the unit in frequently starting and stopping it.

What I claim is:

1. A refrigerator, having in combination a cabinet, an inner shell of sheet metal including a portion arranged to cover refrigerant receiving and circulating means, and an initially plastic stone layer intervening between the inner shell and the cabinet and defining the sharp freezing chamber and serving to act as a hold-over, said shell forming a mold for receiving the plastic stone and for sealing the same after setting.

2. A refrigerator, having in combination a cabinet, a metal shell forming the lining of the cabinet and a sharp freezing chamber, and a cast stone layer intervening between the cabinet and the metal shell and encasing the sharp freezing chamber to form a lowside, said stone acting as a hold-over and said shell serving as a mold in casting the stone.

3. A refrigerating unit having in combination a cabinet including insulating material, one or more sharp freezing chambers formed in said cabinet, said sharp freezing chambers being defined by permanent air tight metallic walls, refrigerant receiving and circulating means positioned in heat conducting relation to said permanently formed wall and said walls serving as a mold for receiving plastically applied material around said walls, said refrigerant conducting means being embedded in said material and said material having relatively high heat conducting and hold-over properties and being of a relatively great mass so as to act as a hold-over.

4. A refrigerating unit having in combination a cabinet including insulating material, one or more sharp freezing chambers formed in said cabinet, said sharp frezing chambers being defined by permanent air tight metallic walls, refrigerant receiving and circulating means positioned in heat conducting relation to said permanently formed walls and plastically applied stone around said walls, said refrigerant conducting means being embedded in said stone and said stone having relatively high heat conducting and hold-over properties and being of a relatively great mass so as to act as a hold-over, said permanent walls serving as molds for said plastically applied material and said plastically applied material filling the entire space between the sharp freezing containers and around the same and also filling in the space between the sharp freezing containers and the insulating material.

5. A refrigerating unit, comprising a cabinet including a lining of insulating material, a metal lining set within the cabinet to form the exposed surfaces therefor and having integrally formed projecting portions forming sharp freezing chambers, means for receiving and conducting a volatile refrigerant positioned in heat conducting relation with said projecting portions forming the sharp freezing chambers, said lining forming a mold for receiving a relatively large mass of heat conducting and hold-over material plastically applied and allowed to set around said refrigerant conducting means, said metal lining excluding the air from said plastically applied material.

6. A refrigerating cabinet comprising an outer shell and an inner shell of insulating material, an inner metallic shell forming one or more sharp freezing chambers and forming the interior exposed surface of the cabinet, refrigerant circulating coils positioned between said metallic inner shell and said insulating material, and a layer of stone filling the space between said metallic shell and insulating material and covering said coils, said stone being initially plastically applied and said metallic shell forming a mold for receiving said stone and for covering the same after the setting operation.

7. A refrigerating cabinet comprising an outer shell, an inner shell of insulating material and a metallic inner shell forming a large storage space and one or more sharp freezing chambers, said shell being spaced from said insulating material, refrigerant conducting coils positioned closely adjacent said sharp freezing chamber or chambers and within said shell, a layer of stone between said shell and said insulating material and covering said coils, said shell serving as a mold for forming the stone walls around the main storage chamber and around the sharp freezing chamber or chambers.

In testimony whereof I have affixed my signature.

LLOYD G. COPEMAN.