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THERMAL INSULATING STRUCTURE

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Fig. 1.

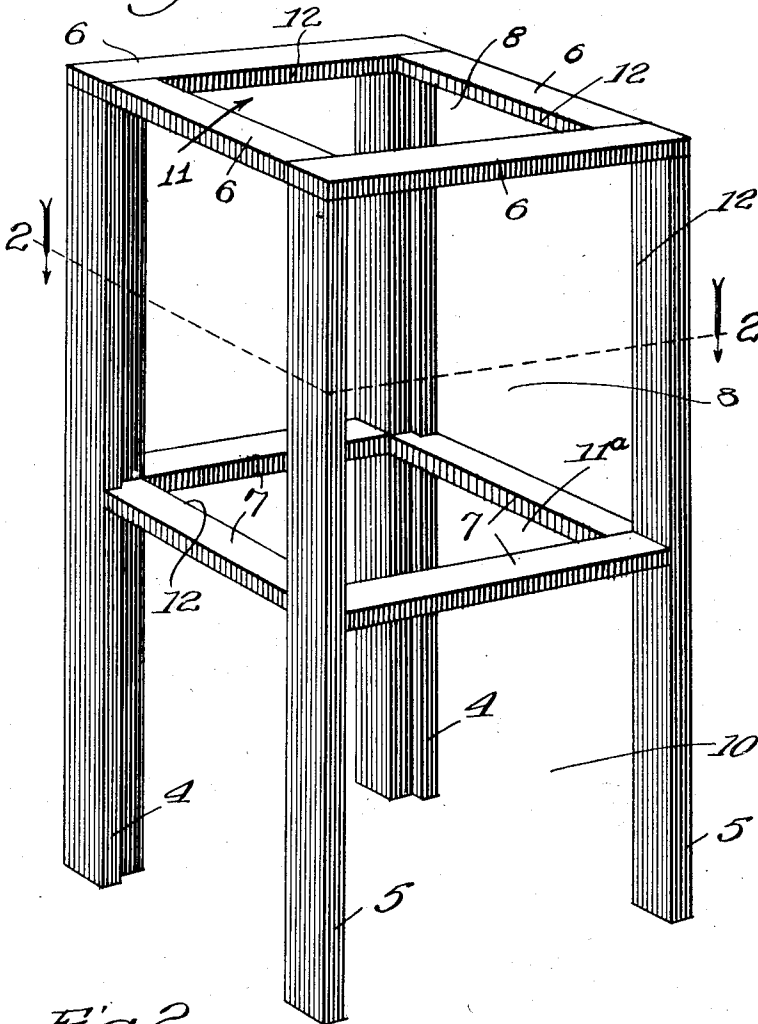


Fig. 3.

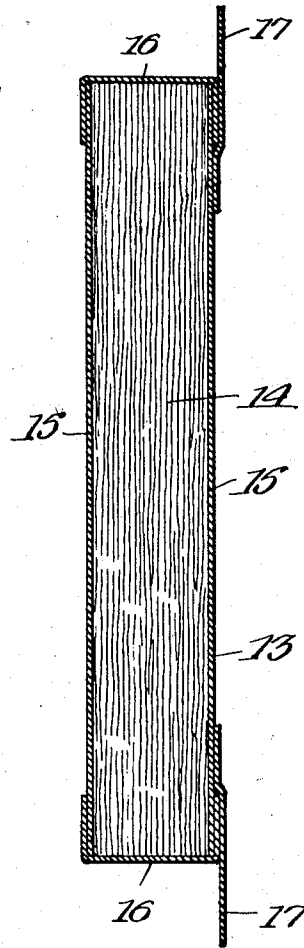
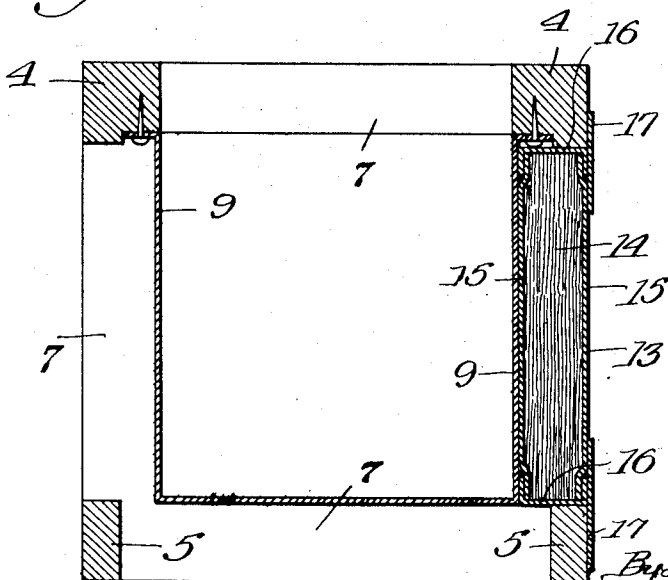


Fig. 2.



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THERMAL INSULATING STRUCTURE.

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My invention relates more particularly to the insulation of structures comprising a frame-work, as for example of wood, defining the space to be insulated and forming openings into such space and in which the insulating material is located; one of the most common structures of this character being the ordinary refrigerator box refrigerated by ice, or by artificial refrigerating means.

These structures are commonly built with a sheet metal casing defining the refrigerating chamber and much difficulty has been heretofore encountered in effectually preventing the penetration of moisture laden air from the atmosphere to the insulating material and the cold sheet metal casing, with the result that the insulating material becomes objectionably damp, particularly because of the condensation of the moisture on the casing, with the manifest objectionable results.

This objection has long been recognized in practice and many different methods suggested and tried, to overcome it, but without satisfactory results.

My primary object is to provide improvements in structures of the character above referred to, to the end that circulation of air as above stated, with the above mentioned objectionable result, is prevented, whereby the insulating material is maintained comparatively dry in the continued use of the structure; to provide for the accomplishment of this result by simple and economical means and of such character that the structure may be readily and inexpensively built; and other objects as will be manifest from the following description.

Referring to the accompanying drawings in which I have illustrated my invention as applied to a refrigerator of the artificially cooled type:

Figure 1 is a perspective view of the frame-work of such a refrigerator. Figure 2 is a plan sectional view taken at the irregular line 2—2 on Fig. 1 and viewed in the direction of the arrow, this view showing the structure illustrated in Fig. 1 with the metallic refrigerating-chamber casing and the insulating body or unit for one of the frame-openings in position in the frame; and Figure 3, a view in sectional elevation of my improved insulating unit.

Referring first to the frame structure

shown in the drawings, this structure is of common construction, it being formed of front uprights 4, rear uprights 5 and upper and lower cross members 6 and 7 defining at the upper portion of the frame a rectangular space 8 to receive the refrigerating-chamber-forming metal casing 9 and a lower space 10 in which the mechanism (not shown) for producing artificial cooling, is located.

The frame thus formed presents the upper and lower rectangular horizontally disposed openings 11 and 11^a and the vertically disposed openings 12.

The openings 11 and 11^a and the openings 12, except the one of the latter at the front of the framing, are provided for receiving bodies of insulating material, the opening 12 at the front of the framing being provided to receive the door (not shown) as commonly provided in structures of this general character.

One of the similar insulating bodies, or units, for insulating the casing 9, and which would be positioned in the openings referred to in the frame, is represented at 13 and in accordance with the particular illustrated embodiment of my invention, comprises generally stated a body of a suitable insulating material 14 enclosed in a covering, or envelope, of sheet material, preferably of such character as to present a high degree of imperviousness to the passage of air there-through and means which seal the joints between the edges of the covered body 14 and the adjacent members of the frame-work.

The body 14 may be of any suitable insulating material, as for example, and more preferably, fibers or strands in comparatively loose or fluffy condition, the maintenance of which condition is desired, as for example kapok and which it is desired be protected against moisture.

The envelope, or covering, for the body 14 may be of any suitable material substantially impervious to the passage there-through of moisture, as for example waterproof paper. This envelope may be formed in any desirable way, as for example and preferably by providing two sheets of substantially the same shape and size as the opening in which the insulating unit is to be located, with strips 16 of similar material applied about the marginal edges of

the body 14 and folded into overlapped position relative to the marginal edges of the sheets 15, as shown, these sheets and strips being secured together by any desirable material, as for example asphaltum, to seal the joints throughout their lengths, the body 10 also being preferably attached to the outer one of the sheets 15 as by any suitable adhesive, such as asphaltum, applied to the inner surface of this sheet.

The insulating unit also comprises flange-
portions 17 which extend outwardly from the body portion of the unit at one face thereof, namely, the outer face of the unit considering it in the position it occupies when assembled with the frame referred to, these flanges extending continuously along the edges of the covered body 14 and each extending at both ends therebeyond, whereby these flange-portions are continuous about the marginal edges of the unit. The covered body portion of the unit being of a shape and size to fairly snugly fit the opening in the frame into which it is to be received, the continuous flange-portions 17 thus provided on the unit 13 overlap the faces of all of the walls of such frame opening; and upon positioning the unit in the frame-opening as stated, these flange-portions 17 are sealed to the frame-work throughout their continuous length, by any suitable material, as for example asphaltum, to effectively seal the joints between the unit and the frame against the circulation of air therethrough and consequent deposition of moisture upon the outer surface of the metal casing 9.

The flange-portions 17 may be provided in any suitable way, but preferably in the manner shown which involves providing a strip of suitable sheet material for each edge portion of the insulating unit, the inner edges of these strip portions overlapping the adjacent turned edges of the strips 16 and the adjacent portion of the sheet 15 which they oppose, to which the strips 17 are adhered, as for example by means of asphaltum, to produce a sealed joint.

The insulating unit is preferably formed complete, namely, with the joint-sealing portions 17 thereon, preliminary to the installation of these units in a refrigerating-structure frame, (where the portions 17 are formed of separate strips as described, these strips being preliminarily sealed to the sheet 15 as for example by asphaltum,) this being desirable, particularly where the body 14 of insulating material is relatively loose or fluffy, as in the case of kapok when provided in the most desirable condition, inasmuch as the only pressure required to be exerted against the insulating unit in sealing the joints between it and the framing is against the outwardly projecting flange-portions 17 which are backed by the adjacent

frame members permitting of the forming of highly effectual seals, without crushing the insulating material 14 or disturbing the proper positioning thereof in the opening in the frame. The sealing of the flanges 17 to the frame members may be effected in a number of different ways, one of which consists in using for the adhesive coating a film of asphaltum compound which may, and preferably is, applied to the flanges before introducing the bodies 13 into the openings in the frame, and after positioning these bodies in the frame running a hot iron over the outer surface of the flange members 17 to press them firmly against the surrounding surface members and soften the adhesive on the strip members to effect the desired sealing of the joints referred to.

It will thus be understood that by constructing a refrigerator in accordance with my invention, circulation of moisture-laden air through the bodies 13 and the joints between them and the walls of the openings in which they are located and into contact with the insulating material and the cold metal casing 9, with consequent condensation of moisture on the casing, and dampening of the insulating material is prevented with the manifest advantage.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto, as the same may be variously modified and altered without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is:

1. As an article of manufacture, an insulating unit comprising a body of insulating material and sheet material relatively impervious to the passage of air therethrough extending across a face of said body and extending laterally throughout said body beyond the marginal edges of the latter to present flange portions extending entirely around said marginal edges, the inner face of said sheet throughout the area thereof opposing said body of insulating material being coated with an adhesive adhered to said body.

2. As an article of manufacture, an insulating unit comprising a body of insulating material and an envelope enclosing said body, said unit presenting about its marginal edges, at one face thereof, outwardly extending flange-portions extending entirely around the edges of the covered body and adapted to overlies a face of the wall portions of a frame surrounding the opening therein adapted to receive such unit.

3. As an article of manufacture, an insulating unit comprising a body of insulating material and an envelope enclosing said body, said envelope comprising opposed

sheet portions spaced apart and edge-covering portions surrounding the edges of said body and sealed to said sheets, said unit presenting about its marginal edges, at one face thereof, outwardly extending flange-
5 portions extending entirely around the edges of the covered body and adapted to overlie a face of the wall portions of a frame surrounding the opening therein adapted to receive such unit.

10 4. In combination, a frame presenting an opening for receiving an insulating unit, and an insulating unit located in said opening and comprising a body of insulating material and an envelope enclosing said
15 body, said unit presenting about its marginal edges at one face thereof, outwardly extending flange-portions overlying a face of the walls defining said opening and so
20 sealed to said walls as to seal the joints between said unit and frame against access of moisture therethrough.

25 5. As an article of manufacture, an insulating unit comprising a body of insulating material and sheet material relatively impervious to the passage of air there-
30 through extending across a face of said body and laterally beyond said body to present flange portions extending entirely around said marginal edges, said body being
held in position relative to said sheet material, and a seal-forming adhesive on one
35 of the faces of said flange portions.

6. As an article of manufacture, an insulating unit comprising a body of insulating material and sheet material relatively impervious to the passage of air therethrough

extending across a face of said body and laterally beyond said body to present flange portions extending entirely around said
40 marginal edges and a seal-forming adhesive on one of the faces of said flange portions and of such character that heat applied thereto renders it adherent for producing a
45 seal.

7. As an article of manufacture, an insulating unit comprising a body of insulating material and an envelope enclosing said
50 body, said unit presenting about its marginal edges, at one face thereof, outwardly extending flange portions extending entirely around the edges of the covered body and
adapted to overlie a face of the wall portions of a frame surrounding the opening
55 therein adapted to receive such unit and a seal-forming adhesive on one of the faces of said flange portions.

8. As an article of manufacture, an insulating unit comprising a body of insulating material and sheet material relatively
60 impervious to the passage of air there-through extending across a face of said body and extending laterally beyond said body throughout the marginal edges of the
latter to present flange portions extending
65 entirely around said marginal edges, the inner face of said sheet throughout its area, including the flange portions thereof, being coated with an adhesive to which said body
70 is adhered, the coating on said flange portions of said sheet serving as a means of sealing said unit in its position of use.

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